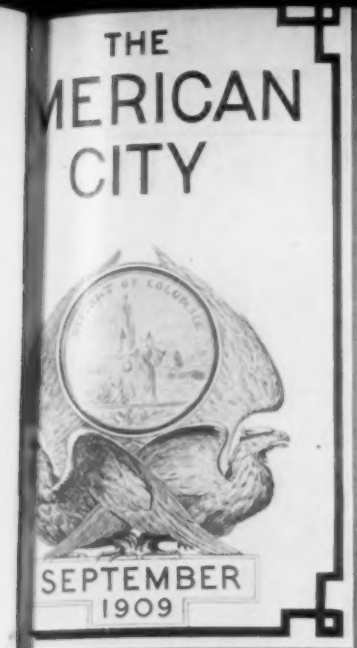
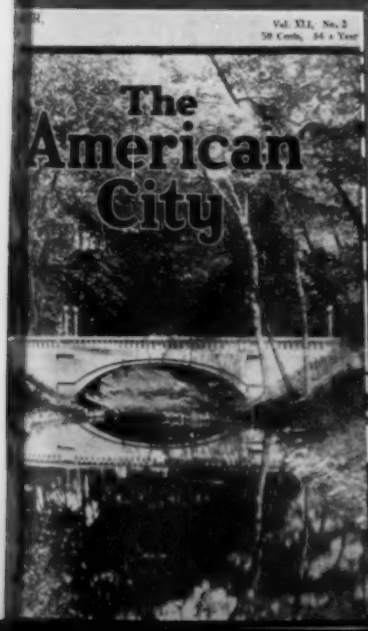




September, 1930

Vol. XLIII, No. 3
50 Cents, $4 a Year

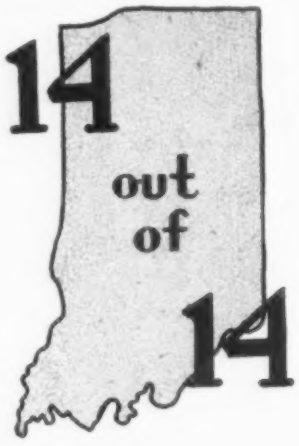
The American City

Twenty-First Anniversary Number

IN this issue leaders in many municipal, civic and public works activities help to commemorate, in a notable series of articles, THE AMERICAN CITY'S coming of age.

Though their authors have no illusions that perfection in municipal government has been attained, these articles give conclusive and inspiring testimony to the tremendous forward strides of the last two decades.

To its host of readers among municipal and county officials, engineers, consultants, and civic workers, this magazine pledges its continued cooperation—for many future decades, we hope—in their efforts, through far-sighted planning and efficient administration, to make the cities, towns and villages of America increasingly orderly, prosperous, safe, and beautiful.



None of Indiana's 14 Largest Cities Is Without Texaco Asphalt Paving

Proof positive of a paving material's standing is to be found in the number of the country's most important cities served by it. For that reason, it should not be overlooked that two-thirds of the largest cities of the United States are partially served by TEXACO Asphalt paving.

Among Indiana's outstanding cities, TEXACO Asphalt has the distinction of serving traffic in all fourteen. These fourteen cities include all those in the State, whose population exceeds 25,000.

The same story of TEXACO Asphalt paving's popularity among leading cities holds true generally: 20 of Massachusetts' 29 largest cities have TEXACO paving; so have 20 of Ohio's 26 principal cities; 12 of Texas' 12 largest; 18 of New Jersey's 23 chief cities; 18 of the 20 largest Illinois cities and 6 of Florida's 7 foremost municipalities.

Delaware Street, a busy thoroughfare of Indianapolis, Ind. Paved with Texaco Sheet Asphalt

Anthony Boulevard, a beautiful residential street of Fort Wayne, Ind. Paved with Texaco Asphaltic Concrete

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In THE MUNICIPAL INDEX (an 850-page annual volume) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY

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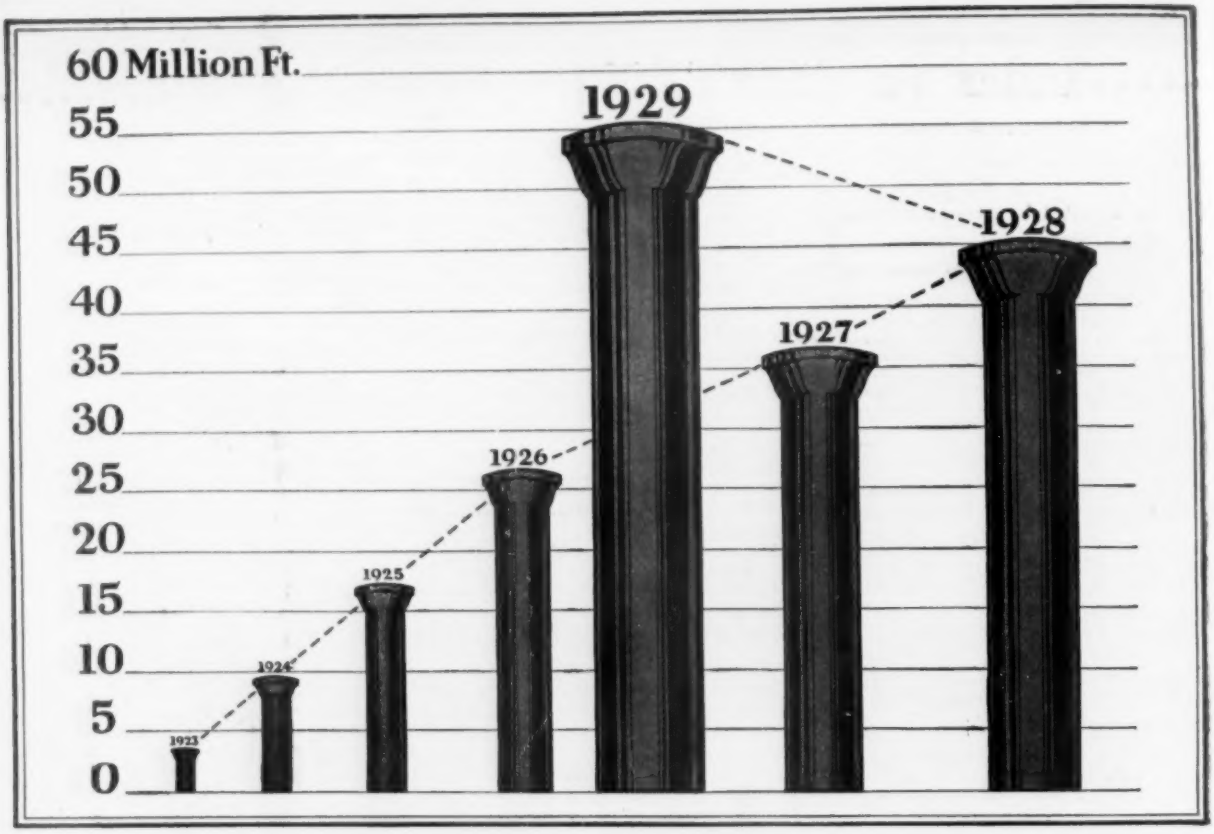

. . . *today*, more than 10,227 miles of U.S. deLavaud Pipe are in service

In December 1929, more than 54 million feet, or 10,227 miles of deLavaud Pipe — manufactured by the U. S. Pipe and Foundry Company — were in service throughout the country. A mighty fine record of acceptance for this sturdy seven-year-old product!

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21st Anniversary and other Items

Mayors and City Managers

Greetings to the Pioneers and to the Newcomers Also!

AN important event in municipal progress which preceded by three months the establishment of THE AMERICAN CITY, was the organization of the New York State Conference of Mayors and Other Municipal Officials. As Mayor Frederick C. McLaughlin, of White Plains, pointed out at last year's convention, in a graphic outline of conditions as they existed in 1909:

"Twenty years ago municipalities did not have to worry about the regulation of traffic, the leisure time of their citizens, safety campaigns, the elimination of grade crossings, jay-walking, bus transportation, prohibition enforcement, zoning, aviation facilities, radio regulation, the control of undeveloped areas, the widening of streets, or the dozen or more forms of insurance they now need to protect themselves. Crime and fire prevention were discussed only by dreamers, and disease-prevention work was in its formative stage. The protection of milk and water supplies and food inspection did not trouble us half so much as did the abatement of common nuisances. All of these are now major municipal problems. . . .

"Two decades ago we were running around in circles trying to find the most efficient and economical method of garbage and sewage disposal, the most equitable system of assessing property, the proper method for controlling current and capital expenditures, a sound municipal pension system, and the quickest and surest way to eliminate inefficiency in public service. . . .

"In 1909 a policeman carried a club and a revolver; now our departments are equipped with high-power motor-vehicles, riot guns and tear-gas bombs. Their speed is now impeded by flat tires instead of flat feet. Training of peace officers was then procured on the beat; now it is obtained in schools from competent instructors.

"When the Conference was created our municipal charities were giving doles to keep the wolf from the door of unfortunate citizens; now our progressive municipalities help dependents to help themselves. Pensions are taking the place of poor orders, welfare is being substituted for charity and homes are supplanting poorhouses.

"In our fire departments motor power with its screeching siren has taken the place of man-and-horse power with the clanging bell. The volunteer fireman with his hand- or horse-drawn steamer, his ladder, his bucket, and his red flannel shirt has been supplanted by the paid fireman, trained in the hydraulics of fire stream, ventilation and chemistry, with motor-drawn fire tower, triple-combination pumper and aerial truck. . . .

"Our street pavements now have to be built to hold up the twelve-ton truck instead of the one-horse shay and to resist the skid chains instead of horse shoes. The familiar white wing of the past has been superseded by the power flusher and the vacuum street cleaner. . . ."

During the twenty-one years which have intervened, mayors, city managers and others in municipal service, individually and through their various state leagues of municipalities and other organizations, have been responsible for a large share of the progress reported in the following pages. It is cheering to know that, as indicated by the partial lists published on pages 153 and 154, a much larger number of appointive municipal officials than is commonly supposed have been serving their communities for the entire twenty-one years or longer. To these pioneers and to the many thousands who have since enlisted in municipal service, THE AMERICAN CITY extends its felicitations on the achievements which have made this birthday issue possible.

Civic-Commercial Organizations and Municipal Progress

NO summary of the municipal progress of the last twenty-one years would be complete without recognition of the important part which chambers of commerce and similar organizations have played in advancing the welfare of their respective communities. Without such organized aids to civic betterment, many a city today would be without the modern charter, or the adequate water-supply system, or the ornamental street lighting, or the fine park or playground, or efficient fire protection, or some other public improvement or service of which its citizens are justly proud.

Among the executive secretaries of civic-commercial organizations there are a few who have held office in the city they are now serving since 1909 or longer. The portraits of two of these veterans are here published. "Then and now" pictures of three others will be found on page 143.

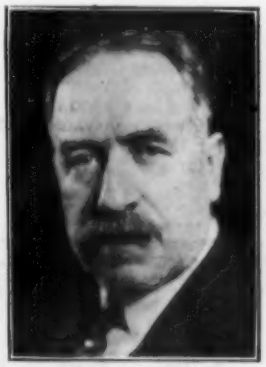


Photo by Blank-Stoller, Inc.

S. C. MEAD

Secretary, Merchants Association of New York, since 1897

Photo by Harris & Ewing

WALTER S. WHITTEN

Secretary, Chamber of Commerce of Lincoln, Nebr., since 1906

Plans for San Francisco Convention of City Managers

THERE is promise of an exceedingly interesting and practical gathering of city managers at San Francisco, September 24 to 27, in the tentative program of the Seventh Annual Meeting of the International City Managers' Association. The principal subjects to be discussed will include Municipal Finance, Personnel Administration, Police Administration, Reporting to the Public, and Getting and Using Facts as Aids to Management.

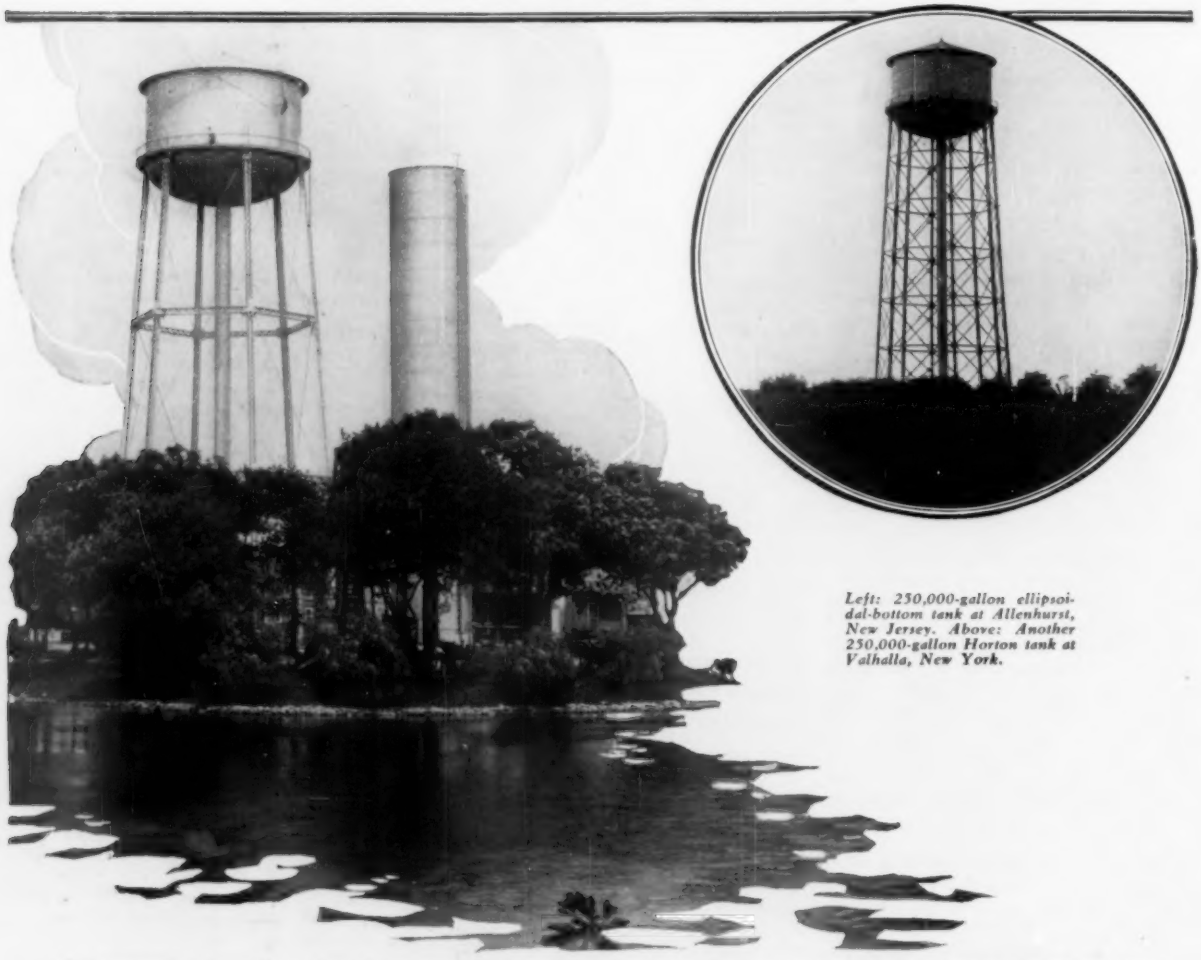
Mobile Establishes Municipal Employment Bureau

WHEN the City Commission of Mobile, Ala., made decision during the month of July to establish a Municipal Employment Bureau as one of the city's departments, it announced that the unemployment situation was not more serious at Mobile than that now existing elsewhere, but it was felt that a central bureau, under municipal auspices, would accomplish much in fitting the person to the job, and the job to the person. Another important purpose of the Bureau is to promote plans for creating additional work.

Writing to THE AMERICAN CITY under date of August 14, City Commissioner Leon Schwarz says:

"The Municipal Employment Bureau of Mobile has been operating about three weeks; during that time about nine hundred persons have registered for work, and of this number employment has been found for more than two hundred applicants. . . . Transients are told that this is a time when every community must take care of its own unemployed and they will not be assisted as long as there are persons out of work who reside here with their families, pay taxes and help support the city government."

What Greater Service to Your City Than Good Water?



Left: 250,000-gallon ellipsoidal-bottom tank at Allenhurst, New Jersey. Above: Another 250,000-gallon Horton tank at Valhalla, New York.

IT is probably true that Americans use more water per capita than any other nation . . . what can bring city officials into good favor more surely than an adequate water system?

Good water implies quantity as well as quality. With ample storage in Horton elevated steel tanks, quantity is secured WITH ECONOMY, for these reasons:

—operating costs are reduced. This is especially true with Horton shallow depth tanks, which decrease pumping costs.

—adequate and uniform pressures maintained, with present pumps.

—torn-up streets for enlarging mains postponed for years.

—more favorable insurance ratings often secured.

—repairs can be made without interrupting service.

Added storage capacity need not mean greater investment in operating equipment. Your pumps and mains simply work 24 hours a day instead of 12 to 18, because water is pumped to storage in off-peak periods for use when demand is greatest.

We will be glad to refer you to cities that have found large Horton elevated storage the most economical answer to water problems, and help you analyze your own storage.

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HORTON TANKS

When you write for that catalog, kindly mention THE AMERICAN CITY

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Water Softening at Lowellville, Ohio

THE public water-supply of the village of Lowellville is obtained from deep wells. The water is of good sanitary quality and is practically free from iron. On account of the hardness of the water, which amounts to 285 p.p.m., a softener was installed and put in operation in November, 1927.

The capacity of the plant is 300 g.p.m. It is operated for a period of about 6 hours a day to supply the normal consumption of about 85,000 gallons. It is necessary to regenerate the softener but once a day, and the time required is about one hour. As a pressure softener of the upward flow type is used, with a standpipe on the distributing system, automatic devices have been installed to shut off the pumps and the softener, so no attention is given the plant other than that required for regeneration.

The amount of water which passes through the softener is 81 per cent of the total used, while 19 per cent of the raw water is by-passed. Water used in washing the brine from the softener following regeneration is 6 per cent. The hardness of the water delivered to the city is about 80 p.p.m.

Up to date, 22,907,000 gallons of softened water have been delivered to the village. The chemical cost has amounted to 2.9 cents per 1,000 gallons, with the cost of salt at $8 per ton delivered.

This type of plant is feasible where well water of good sanitary quality and free from iron is available. The advantages of the zeolite softener for a small municipality over the lime-soda softening plant are:

1. Lower initial cost
2. Lower labor cost for operation
3. No expert supervision necessary
4. One pumping of the water required for pressure type softeners

From a paper read before the Ohio Conference on Water Purification.

Boring Holes for Pipe Laying Under Pavements

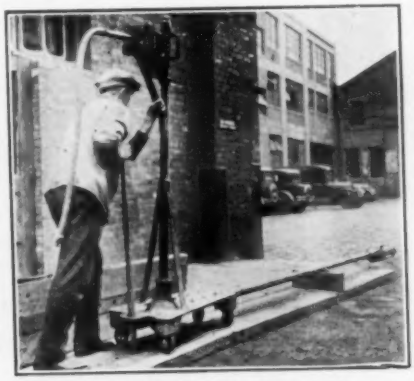
AN interesting machine for boring holes under pavements for the installation of pipes has been developed by the Rochester Gas & Electric Corporation, Rochester, N. Y.

The machine consists first of a boring tool, varying in size from 3 to 8 inches in diameter; second, a Ford differential mounted upon a carriage and used to transfer the vertical rotation to a horizontal rotation, and also as a speed reducer; third, a motor, driven with air furnished by a portable air-compressor.

The corporation has had considerable opportunity to use this machine since its construction, and has found it quite satisfactory for most types of soil. It has been possible to bore holes up to 8 inches in diameter under 24-foot pavements and through clay, hardpan and, in some cases, clay and small boulders.

In the ordinary operation of the machine, the tool is fed in about 2 feet by means of the bar. It is then withdrawn and the earth removed from the tool. This process is repeated until the hole is finished. In certain types of hard clay, however, it has been found necessary to bore a small pilot hole about 3 inches in diameter first and ream this hole with one or two reamers. This plan will often work in soil containing stone and small boulders, as these obstacles are moved and turned so that they can be extracted from the hole.

L. H. EAST,
Assistant Superintendent, Gas Distribution Department, Rochester Gas and Electric Corporation.



BORING MACHINE FOR INSTALLING PIPES UNDER PAVEMENTS

Duck Catastrophe

SO excellent were Turkish aqueducts, Turkish wells, Turkish baths, in the Middle Ages, that complacent Turkish conservatives have not dreamed of improving them for the past 500 years. Young Turks campaigning for modern water-works for Turkey's larger cities seized on the "Duck Catastrophe" at Ihlamour last week, argued emotionally in the Turkish press.

In Ihlamour, suburb of Constantinople on the Asiatic side of the Bosphorus, source of drinking water for generations has been a single deep, narrow well in the market place. Housewives and porters gathered there every morning to draw water for their daily needs. There one Yusuf Hanoum, leather worker, sat down to rest last week, while his pet duck, name unknown, hopped up on the well curb to keep him company. A stray dog frightened him. With an agitated squawk Yusuf's duck fell into Ihlamour's well. Unable to extricate his pet, Leather Worker Hanoum dropped half a loaf of bread and a large piece of goat's milk cheese down the narrow 50-foot well to keep his duck from starving, went to warn the authorities.

For several days, the best minds of Ihlamour bent to the task of extracting Yusuf's duck. Scheme A was to lower a large shallow bucket down the well in the hope that the duck would swim into it. Several times the duck did so, but always flopped out before the bucket could be hauled to the surface. Scheme B was to tie fish lines to hard indigestible crusts of bread in the hope that Yufu's duck would swallow line and crust, allow himself to be hauled to the surface. Yusuf's duck did not. Scheme C: a reward was offered to any citizen of Ihlamour who would allow himself to be lowered 50 feet down the well to grab Yusuf's duck with his bare hands. The first volunteer jammed ignominiously when the well bore unexpectedly narrowed 30 feet below the surface. The rope broke, he was rescued only with difficulty.

Disgusted at these futile attempts, the commandant of the nearest garrison ordered a squad of soldiers to the Ihlamour well-head. An officer barked commands. The soldiers fired ten rounds rapidly down the well. When the smoke cleared away Yusuf's duck was heard quacking irritably from the abyss. Superstitious Mussulmans fled from the neighborhood, claiming that the duck was bewitched. City authorities posted the well as unfit for drinking purposes. While Ihlamour city fathers concentrated on the problem of duck extraction, Ihlamour householders were forced to go nearly two miles to the nearest unpolluted well.

—As reported in *Time*.

Meters Removed for Testing in Oil City

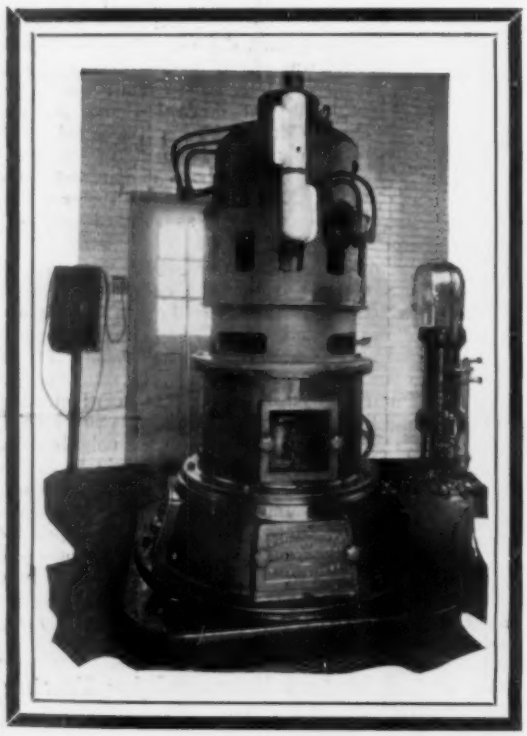
THE largest industrial meters in service in Oil City, Pa., are 4 inches and are ordinarily tested in the same manner as the small meters. They are removed to the meter testing room and the discharge weighed. Occasionally, tests are made of such meters in the line by attaching another tested meter.

In accordance with the rules of the Pennsylvania Public Service Commission, periodic tests are made at least as often as required, according to the following schedule:

⅝-inch meters, 10-year period or 10,000 cubic feet registration
¾-inch meters, 8-year period or 150,000 cubic feet registration
1-inch meters, 6-year period or 300,000 cubic feet registration

ARTHUR W. MARTIN,
Superintendent, Water Department.

BUILT FOR ENDURING SERVICE



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Write for bulletin and tell us about your pumping or water-supply problems. There is no obligation and perhaps we can help you.

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Supt., Water Works
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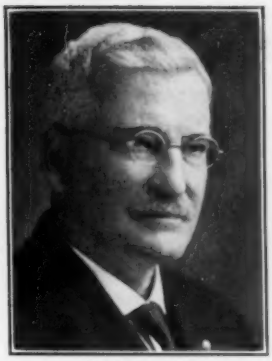

JAMES S. RICE
Supt., Water Works
Claremont, N. H.
(Appointed 1889)

THOMAS J. SKINKER
Engr., Water Division
St. Louis, Mo.
(Appointed 1924)

JAMES R. LOSEE
Supt., Water Works
Tarrytown, N. Y.
(Appointed 1927)

C. E. HUTCHESON
Supt., Water Dept.
East Point, Ga.
(Appointed 1916)

Who's Who in Water Supply

The 33rd of a Series of Portraits of Water Works Officials Which Has Appeared Monthly Since January, 1928

W. GUY HUDSON
Supt., Public Works
Decatur, Ga.
(Appointed 1920)

PAUL A. TVARGOSKY
Mgr., Water Works
Vicksburg, Miss.
(Appointed 1928)

GEORGE B. GUILD
Supt., Crystal Water Co.
Danielson, Conn.
(Appointed 1919)

C. W. BURDICK
Water Commissioner
Grand Island, Nebr.
(Appointed 1920)

J. R. CORTESE
Supt., Water Works
Livingston, Mont.
(Appointed 1919)

CLAUDE W. ABSHER
Supt., Water Works
Mount Airy, N. C.
(Appointed 1926)

F. A. MENVILLE
Supt., Water Works
Houma, La.
(Appointed 1923)

ALBERT STAFRIN
Mgr., York Water Co.
York Nebr.
(Appointed 1923)

ROBERT BRUCE MILLER
Mgr., Water Dept.
East Chicago, Ind.
(Appointed 1925)

PITTSBURGH DES MOINES

300,000 gallon tank on a 100-foot tower at Grinnell, Ia. The tank is 36 feet in diameter, 28 feet, 1¼ inches high with a riser 48 inches in diameter. Completed June, 1930

Cut the Costs of Forced Pumping

Water pumps that labor 24 hours a day to keep mains full are no longer necessary. By filling an elevated tank during slack hours, the same pumps can create a cost-saving reserve supply of water in a PDM tank of proper capacity, that will service the entire city adequately during peak load hours.

A strong elevated gravity pressure will save the cost of torn-up streets to install larger water mains. Inadequate service often results from the *low pressure* available, and *not* from too small water mains.

Our 48-page Municipal Water Works Catalog tells how other cities have cut their water supply costs. Write for a copy.

Pittsburgh-Des Moines Steel Company

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905 Tuttle Street, Des Moines, Ia.
607 Hudson Terminal Bldg., New York City

Chicago **Atlanta** **Dallas** **San Francisco** **Seattle**

Why not remember to mention THE AMERICAN CITY?

Sewage Treament Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Sludge Disposal Methods at Schenectady

THE sludge produced in the Imhoff tanks at the sewage treatment works at Schenectady, N. Y., is pumped to open sand-drying beds. The sludge is removed when dried to a cake of about 65 per cent moisture, by means of industrial cars, and transported to piles in the storage field by means of a dump-wagon. The sludge produced since 1924 has been disposed of to the farmers of the section as a fertilizer. Sludge has been used on all types of crops on both sandy and clay land, and success has been reported by farmers and local householders. The price obtained for sludge is 25 cents per load of approximately 2 to 2½ yards. The annual budget of the Bureau of Sewage Disposal estimates a yearly revenue of $150 to be derived from the sale of air-dried sludge.

MORRIS M. COHN,
Sanitary Engineer, Bureau of Sewage Disposal, Schenectady, N. Y.

Demand for Sludge Increasing in Marion, Ohio

A TOTAL of 13,348 cubic yards of sludge varying in solids from 5.2 per cent to 12.0 per cent was removed from the Imhoff tanks of the sewage treatment works at Marion, Ohio, in the year ending June 30, 1928. This represents a total of 826 tons of dry solids. Part of the sludge was pumped to an adjacent field for filling low ground and covering débris due to construction.

Under favorable conditions of humidity, temperature and wind currents, sludge applied on the sludge beds to a depth of 10 inches was dry enough for removal five days after the application, but generally a 10-inch application of sludge was not dry enough before a week or ten days. Sludge is considered dry enough for removal when the moisture content is about 65 per cent.

Sludge dried during the first two years was used largely to fill low ground around the plant site and for building up the fertility of the lawn. After this was accomplished, considerable quantities were given away to farmers and gardeners, who experimented with it on farm and garden truck. It was the opinion of all who used it that it not only was a valuable fertilizer but also supplied the much-needed humus for lightening the heavy clay soil of the community. As a result, it was decided to market the entire output, giving it the trade name of Humusite.

A few short advertisements were placed with the local newspaper, but an increasing demand has been brought about largely by the efforts of the people who use it, until now there is a demand for all of the sewage sludge as a fertilizer.

Present prices for the sludge are as follows:

Single loads of one cubic yard at the plant	$2.00
Single loads of one cubic yard delivered	4.00
Larger quantities, per cubic yard at the plant	1.50
Dried, pulverized and sacked, per 100 pounds	1.15
Dried, pulverized and sacked, per ton	20.00
Dried, pulverized and sacked, more than 5 tons, per ton	15.00

Revenue at the present rate averages about $100 per month.

FLOYD G. BROWNE,
Superintendent and Chemist, Marion Sewage Treatment Works.

Sludge Given to Farmers Without Charge

THE sludge from the Imhoff tank system of the Eastern disposal plant of Altoona, Pa., is given away to farmers, who haul it from the plant during the winter months and obtain excellent fertilizing value from the sludge, which would otherwise accumulate and require greater expense on the part of the city for its ultimate disposal.

The agricultural section adjoining the disposal plant is very limited in extent; otherwise, the demand might reach the point where it would be profitable for the city to sell its sludge.

The Western disposal plant is of the broad irrigation type, no attempt being made to grow crops, as the frequency of sewage application would destroy them.

H. J. BAUM,
City Engineer.

Sewers Laid in Alleys in Kelso, Wash.

ALL sewer laterals in new districts of Kelso, Wash., are laid in alleys, where possible. It has been found that sewers in alleys cause less disturbance during construction and in general are closer to the point where the plumbing leaves the houses. This makes a shorter and consequently more economical house connection and also secures a better grade. Sewers are usually laid 1½ feet from the center of the alley, the other side being reserved for water-mains or other utilities.

The practice of placing a lateral on each side of the street has never been followed in Kelso. The streets in general are not wide enough to warrant such a layout, being generally but 60 feet in width. There is one boulevard, however, 80 feet in width, where such a system would be very advantageous and could have been built at a cost little, if any, greater than for a single line. This street has a general 5 per cent grade to the west, and the ground is higher on the north side of the street than on the south. The sewer is 20 feet north of the south property line and is approximately 5 feet under the surface. If this sewer had been laid with a lateral on each side of the street and in the parking strip about 8 feet from the property line, the added cost of the extra lateral would have been more than offset by the saving in house connections. The cost of two or three manholes would probably have raised the final cost somewhat above the cost of a single sewer, but this could be balanced against the convenience of having shorter house connections and consequently much greater fall between house and sewer, which is badly needed.

Where the laterals have to be placed in the street, the present practice is to place them at one side, near the curb, the other side being reserved for storm sewers and water-mains. There is no particular reason for this, except that it keeps the centers of intersections clear for survey monuments or other markers, and balances the layout of underground utilities.

There is no difficulty in assessing house connections, whether the sewers are in the center of the street or at one side, as they are put in when the sewers are laid, one to a lot, and carried out to the line of the curb and assessed as a part of the improvement to the district as a whole.

W. H. RICHARDSON,
City Engineer.

Odor Nuisance from New Tank Quickly Corrected

A VERY concentrated, fresh, uncomminuted sewage is treated at Pontiac, Mich., giving practically no nuisance from odors under normal operating conditions.

In 1927 another Imhoff tank was added to the original installation of three. At that time there was no laboratory control of the treatment plant. When installation of the new tank was completed, raw sewage was allowed to flow into it without seeding the digestion compartments with digested sludge. The result was that during the summer of 1928 odors were in evidence, due to incorrect digestive conditions in this tank.

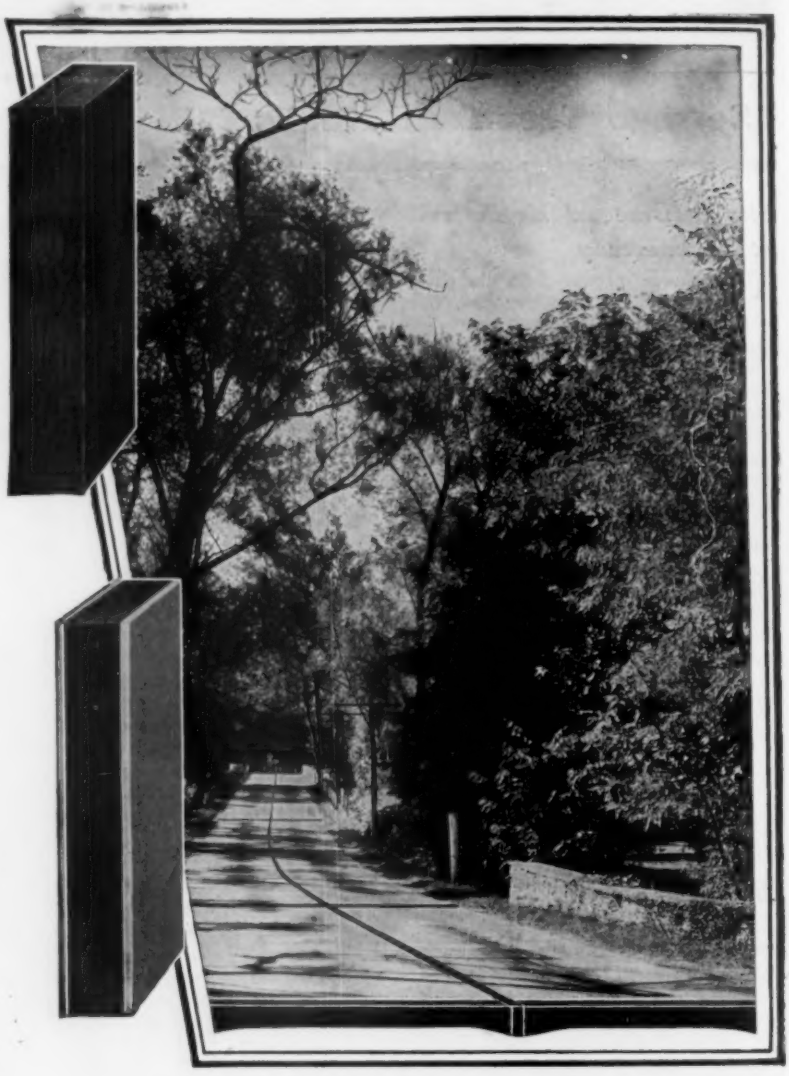
A small laboratory was installed in November, 1928, and tests showed that the sludge compartments of the new tank were full and that the pH was less than 5.5. Enough lime was added to bring the pH up to 7.0. Foaming and odors were eliminated within three weeks, and with careful control and intermittent additions of lime, within two months this tank was producing the same satisfactory effluent and sludge as the other tanks.

HERBERT A. OLSON,
Special Sanitary Engineer.

Wanted—

more streets
built—
—with

VISION



One of the greatest authorities in this country on concrete highway engineering says:

"—And I would put expansion joints every 35 feet, with some kind of expansion joint filler that would really take care of temperature and moisture variations."

Failures are *built into* roads and streets when no provision is made for "really taking care of temperature and moisture variations."

And, without intent, the quotation describes to the letter the performance of Servicised Expansion Joint.

SERVICISED
LOOK FOR IT ON ALL PURCHASES

SERVICED APPROVED PRODUCTS

Expansion Joints for Roads, Streets, Sidewalks, Buildings
Fibrated Asphalt Plank for Bridges, Runways, Platforms
Highway Crossing Rail Filler and Track Insulation
Sewer Pipe Jointing
Industrial Flooring
Waterproofing

Other Fibrated Bitu.minous Construction Materials

What Are Servicised Expansion Joints?

They are premoulded safety strips which protect concrete structures against the destructive results of stresses set up by natural causes.

They are produced from specially refined asphalts to which fibers are added for elasticity and reinforcement, then formed hot under pressure into the required shapes.

They do not deteriorate in stock or on the job and can be handled as easily as a board.

By protecting municipal structures of the rigid type against cracks and bursts due to rapid expansion and contraction, the money is saved for more municipal construction.

Begin now by getting Catalog 11 *and estimates for that job in hand.*

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When you write for that catalog, kindly mention THE AMERICAN CITY.

Construction and Maintenance

Engineering and Highway Departments

Reports Indicate Increased City Street Paving in 1930

OFFICIAL figures received from a majority of the 88 cities in the United States having a population of 100,000 or more, in a census of paving taken by the Asphalt Institute, New York, show that 1929 witnessed the construction of approximately 45,000,000 square yards, or about 4,400 miles, of new city pavements of a higher type than waterbound macadam, an increase of about 11 per cent over 1927 and 1928.

The returns also show that a tremendous paved yardage is in prospect for 1930. City paving, in the larger cities at least, according to indications, will be from 15 to 20 per cent greater in 1930 than in 1929.

Returns from the census show that in 63 cities, or about 75 per cent of those over 100,000 population, a total of 32,491,908 square yards, or about 3,200 miles, of new pavements of a type higher than waterbound macadam, were constructed in 1929. Asphalt streets totaled 21,633,496 square yards, or approximately 2,060 miles, and the other types higher than waterbound macadam amounted to 10,858,412 square yards, or approximately 1,160 miles.

For 1930, cities in the Middle Atlantic States will lay approximately 12 per cent more pavement than in 1929. Those in the East-South-Central States will increase their yardage by at least 4 per cent; and cities in the West-South-Central States will show an increased construction of about 58 per cent. Construction in New England, South-Atlantic, East-North-Central and Pacific Coast cities will but slightly exceed that of 1929 in some cases and in others will equal the improvements of last year.

Types and Costs of Intermediate Bituminous Surface Treatments

A REPORT covering the bituminous surface treatments throughout the country that are considered as intermediate types in the stage-construction process between the untreated low-cost surface and the high-type pavements, has been prepared by Subcommittee No. 3 on Plans, Specifications and Construction of Surface Treatments of the American Road Builders' Association General Committee No. III on Design and Construction, of which C. E. Burleson, County Engineer, Pinellas County, Clearwater, Fla., is General Chairman.

The report outlines the distinctive methods and materials of construction that have made it possible to segregate the intermediate bituminous surface treatments into the following general types and costs per 10 feet width and of varying depths:

Description of Type	Cost Per Mile	Traffic Capacity in Average Vehicle Per Day
Single bituminous surface treatment (mat type)..	$300-$ 1,000	800-1,000
Dual bituminous surface treatment (penetration-Florida Type).....	$1,100- $3,000	1,000
Mixed-in-place bituminous—fine aggregate (Wisconsin and general type).....	$800-$5'000	800-2,000
Mixed-in-place bituminous surface—coarse aggregate (Western or Oregon type).....$	1,100-$ 3,000	800-1,500
Mixed-in-place bituminous surface—coarse aggregate (Eastern or re-tread type).....$	2,000-$ 4,500	1,000 or more
Premixed bituminous surface, laid cold (a new development except for patented types such as Tarmac, Amiesite, etc)	$7,000-$12,000 or more	not determined
Premixed bituminous surface, laid hot (standard sheet asphalts, and bituminous concretes with their modifications such as sand-asphalt).....	$10,000-$25,000	1,000-2,000 or more
Natural rock asphalt (Uvalde, Kyrock, Alabama rock asphalt)...$	3,500-$ 6,500 or more	1,000-2,000
Bituminous macadam, hot penetration (used in New England States for past 15 years).....$	9,000-$17,000	1,000-2,000
Modified or "puddle" bituminous macadam, hot penetration (West Virginia and Virginia)....$	7,500 and more	500- 800 or more

CHAIRMAN, W. E. DUCKETT,
County Engineer, Hennepin County, Minneapolis, Minn.

Dynamite Used to Protect Bridges from High Water

IN the spring one of the problems with which highway engineers are confronted is the overcoming of the menace of flood waters to bridges. This danger can often be averted by the use of explosives to put the streams back in their channels after their courses have been changed by erosion of the original banks. Sometimes relief is afforded by diverting part of the excess water through a ditch. Another method is to clean out the clogged and filled-in stream beds, for which dynamite is very useful.

Last year a $10,000 bridge near Muscotah, Kans., was saved by the timely use of dynamite to control the flow of the creek spanned by the highway bridge. Roy Coleman, County Engineer of Atchison County, was in charge of the work, which consisted of the blasting of 180 feet to a depth of 14 feet with a top width of 25 feet and tapering to 4 feet at the bottom. Four men completed the work in 10 hours, the work being done with 1,100 pounds of dynamite.

On the outlet end of the ditch were two large cottonwood trees and a cluster of maples. One cottonwood was entirely removed by the blast. Holes were driven 12 feet deep with a 6-inch post hole auger, spaced on 5-foot centers in a single row. Three pounds of explosives per foot of depth of hole were used except where there were trees and stumps, and there the loading was heavier. It is estimated that the one big blast of dynamite saved the county's $10,000 bridge from destruction.

At another bridge on a Kansas highway, a 350-foot ditch was blasted to save the structure. The ditch was 9 feet wide at the top and 4 feet at the bottom. Holes were placed 5 feet apart and were made 8 feet deep with a 6-inch post hole auger. Twenty-four pounds of dynamite were placed in each hole, and 1,850 pounds were used for the entire job. The soil was of heavy black bottom texture and was extremely dry. Electric blasting caps were used on each hole with 12-foot wires.

—*Explosives Progress.*

Central Highway Outstanding Road Project in Cuba

CUBA has approximately 1,660 miles of highways and an area of 44,164 square miles, or about one mile of highway to every 27 square miles of area. The automobile registrations per year are 45,254, or approximately 27.3 vehicles per mile of highway. The population of Cuba is 3,579,507, making a population of 81.1 per square mile and about 86 inhabitants for every motor vehicle.

During 1929, the major activity in the highway program was the construction of the Central Highway, which extends the entire length of the island and is a hard-surfaced road with concrete base and asphaltic concrete surface. The original contract was approximately $76,000,000, but the ultimate cost, with its improvements, will run to over $100,000,000. During 1929, $32,759,636.84 was spent. The amount to be spent in 1930 depends upon the methods of financing. It is expected that the highway will be completed by May, 1931.

Already a few of the lateral roads have been constructed and, upon the completion of the Central Highway, an undertaking consisting of the construction of the lateral roads will be commenced and carried to completion as quickly as possible.

Practically all of the machinery used in the construction of the Central Highway is of American manufacture, although there are a few English rollers.

—From a report of the American Road Builders' Association.

Sixteen little points that loom BIG later

Water baffled above nozzles (6) insures constant smooth flow of water.

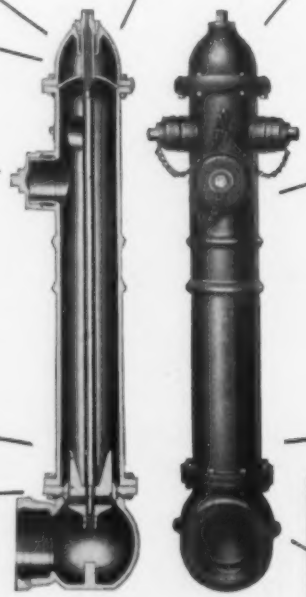
The stuffing box (4) is repacked from the top of the hydrant without unbolting the hydrant bonnet.

All working parts removable through the top of the hydrant without disturbing the hydrant barrel.

Working parts easily lubricated. Oil holes conveniently located and clearly marked.

Built in strict accordance with American Water Works Association specifications.

Hydrant barrel (22) of extra large diameter. Has no cross obstructions to impede the flow of water.



Broken hydrant barrel can be replaced without cutting the water off at the valve.

The drain (24) is automatic, dependable. No springs, rams, levers, toggle joints or synchronized screw adjustments to get out of order.

Specially treated drain valve leather, dovetailed and screwed, cannot possibly come out in service.

Should street levels be raised, hydrants can be lengthened easily and economically with our extension sections.

Metallic gasket forms positive water-tight joint and always comes out with the seat ring.

"Vim" leather valves. Three times the abrasive strength of any other leather. Water-proof, oil-proof, acid-proof. Heat-proof up to 300° F. Will last two or more times longer.

All bronze working parts machined to three thousandths inch, gauged and checked.

All working parts machined to permanent steel gauges, and are interchangeable.

A compression type hydrant — if the barrel is broken, no water is freed to flood the streets.

Tested to 300 pounds hydrostatic pressure. Certificate furnished on request.

Columbian

IRON WORKS

CHATTANOOGA, TENNESSEE

GEORGE BURNETT
Webster County Engineer
Fort Dodge, Iowa
(Appointed 1923)

HENRY L. HOWE
City Engineer
Rochester, N. Y.
(Appointed 1928)

SAMUEL P. MATTHEWS
City Engineer
Ardmore, Okla.
(Appointed 1923)

JAMES C. McCLEAN
Woodbury County Engineer
Sioux City, Iowa
(Appointed 1916)

MERRILL D. KNIGHT, JR.
Director of Public Works
Lynchburg, Va.
(Appointed 1925)

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

L..RMAN BEAL
City Engineer
Omaha, Nebr.
(Appointed 1921)

EDWARD L. SAILER
City Engineer
Cape Girardeau, Mo.
(Appointed 1919)

GEORGE WALLACE CODWISE
City Engineer
Kingston, N. Y.
(Appointed 1928)

J. K. FRASER
City Engineer
Rensselaer, N. Y.
(Appointed 1930)

PERRY T. NAYLOR
City Engineer
Hastings, Nebr.
(Appointed 1920)

CLARENCE O. MANKER
City Engineer
Sedalia, Mo.
(Appointed 1923)

S. M. HELGELAND
County Engr., Humboldt Co.
Humboldt, Iowa
(Appointed 1928)

H. D. SMELSER
City Engineer
St. Charles, Mo.
(Appointed 1924)

HARRY J. HAUMER
City Engineer
Gloversville, N. Y.
(Appointed 1913)

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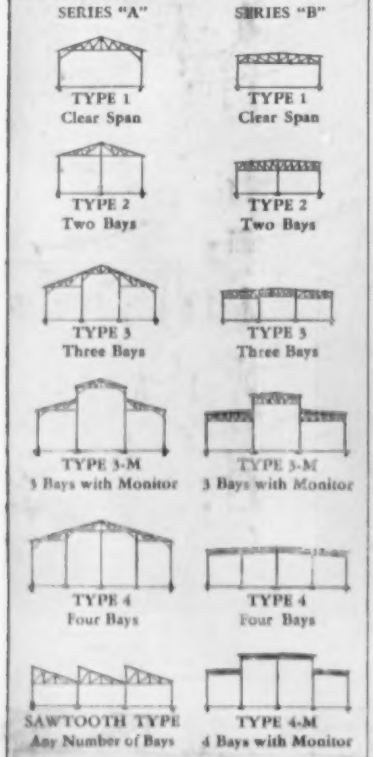

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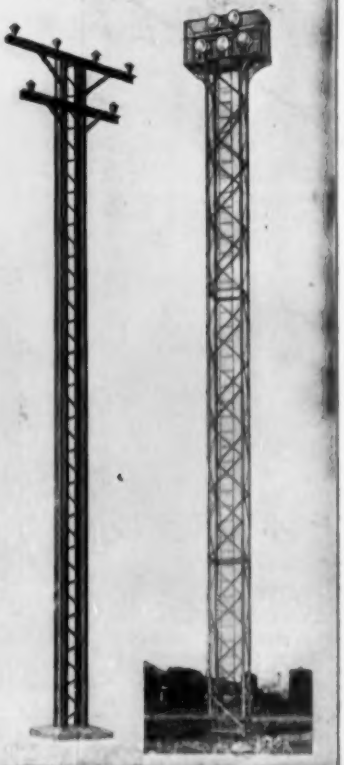

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Superior in design and workmanship. A complete line with a type for every building.

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Available in stock types and in special designs for hangars, fire houses, and industrial buildings.

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Insulated to any degree and water-proofed. Light in weight—fireproof—quickly erected—economical.

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Steel Joists for floor and roof construction. Everything in Reinforcing Steel for concrete.

TRUSCON STEEL COMPANY YOUNGSTOWN, OHIO

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Miniature Golf Again

A Pressing Problem of Popular Recreation

Outstanding Aspects

MINIATURE golf shows signs of becoming a major industry. According to the United States Department of Commerce, there were about 25,000 of the pygmy courses in operation on August 11, representing an investment of $125,000,000. Most of these have been started this year. The rate of their increase is enormous. *The end is not yet in sight.* The concern of the government's commercial experts in making a study of this phenomenal amusement is limited to its aspects as a utilizer of trade products. The concern of municipal officials, civic organizations and private citizens is differently occasioned—a fact made clear in returns from THE AMERICAN CITY's questionnaire to the city managers of the country (see the August issue, page 17), by inquiries from cities, and by almost daily headlined news stories.

There is the miniature golf course as a source of public revenue: What rent shall be charged this large profit-maker for use of public land? (At least one city, Cincinnati, has forbidden such use at *any* price.) What license fee shall be collected from courses on private land? Then there is the question: What restrictions shall—or legally can—be placed upon the location? Also: What restrictions can be placed upon night playing, or Sunday playing where residents may be disturbed by noise and illumination?

Solutions, and Attempted Solutions

Ten, and even 15 per cent of gross receipts is being charged by park officials and others for rental of public land for courses. Elsewhere, substantial license fees are being imposed—and paid. The game has been barred from the residence districts of some cities under zoning ordinances. One of the most recent decisions sustaining such a restriction was given by Justice Graham Witschief in the White Plains, N. Y., court. In Birmingham, Ala., the zoning ordinance was modified to permit miniature golf courses in class A residence districts where they do not "tend to impair the health, safety, convenience or comfort of the public including that portion of the public occupying the property immediately contiguous to the proposed golf course." The amendment further states that if 75 per cent of the property owners within 150 feet of the proposed site do not object then it shall be automatically considered that the project is not objectionable. Appeal from this ruling has been taken in a case to be heard in the state Supreme Court in November. In Orange, N. J., attempt is now being made through the courts to invalidate residence zoning restrictions against the pygmy golf courses. In Glen Ridge, N. J., a five-year permit for such a course in a residence neighborhood has been granted over opposition of a group of 25 neighboring property holders. It was recommended by the zoning board of adjustment which previously prohibited an apartment house on the property.

Miniature golf courses in Massachusetts must now be licensed under the state's Sunday Entertainment Law and all other licensing is invalid according to an opinion handed down by Attorney General Joseph E. Warner on August 14. Here and there, elsewhere, the problem has assumed the aspect of a moral issue. The largest crowd that ever attended a city council meeting in East Orange, N. J., was present when a 6 to 4 vote banned miniature golf on Sundays in that city. The ordinance, introduced by Mayor C. H. Martens, was strongly backed by the clergy. A proposal of the operators to give 10 per cent of all Sundays receipts to the City Welfare Federation was rejected.

Night noise on many New York City courses, of which there are 240 of the trade-marked factory-made variety, and nobody knows how many more, has caused the Health Department to rule for "silent playing" after 11 o'clock, though the areas may be legally operated to 3 a.m. The Supervisors of Los Angeles County, Calif., have drafted "curfew" regulations for unincorporated communities under their jurisdiction.

The Questionnaire Returns

Of the total of 266 replies received from city managers to August 20, 55 reported no courses. The largest number of courses reported from any one city was "about 80" in Oklahoma City. Thirteen cities reported commercial courses operated on public property rented for the purpose. From 76 cities license fees were reported, ranging from $1 per month in a number of places to $1,000 per year in Coral Gables, Fla., with $25 and $50 per year among the most frequently stated charges, and with a noticeable tendency toward higher licenses in later returns than in earlier. Twenty cities reported courses permitted in zoned residence districts, three being under specific conditions. From 67 cities, restrictions were reported on evening and Sunday playing hours, Sunday playing being forbidden in a number of instances. In 36 cities, protests have been registered against the noise.

The Present Prospects

Miniature golf can indisputably lay claim to having inspired more new legislation and called into play more existing legislation in a few months than any other form of entertainment on record. *And the end is not yet in sight.*

But that the end may shortly loom into view is intimated in an editorial in the *New York Evening Sun* which mentions the precedent of Mah-jongg, the Ouija Board, Coueism, and pyrography, as great national pastimes as feverish as they were brief; and also by a *New York Times* article in which is expressed the view that many of the multitudes of miniature golf course proprietors will by next year have made a fortune, or gone back to their old jobs of greens keepers on courses designed for sure-enough golf. From Morgantown, W. Va., it is officially reported that interest in the game is on the wane; and from Owensboro, Ky., comes news that the original miniature golf course has already been dismantled for lack of patronage.

IN EAST CLEVELAND, OHIO

Proprietors of this commercial course pay 19 per cent of gross receipts to the city for rental. Receipts average $150 per day

90.6% EFFICIENCY

7000.000 G.P.D.

A WORLD'S RECORD

This announcement is of vital importance to all water works and industrial engineers seeking the most economical pumping methods. This company believes that the new line of Byron Jackson Type "S" horizontally split case centrifugal pumps shows the highest hydraulic efficiency so far attained. The following test results were obtained in the field by the testing engineers of the purchaser who paid a substantial cash bonus for efficiencies actually realized above certain guarantees:

	Head	Overall Efficiency	Pump Efficiency
4 MGD	95 feet	79%	86.8%
7 MGD	120 feet	85.1%	90.6%
9 MGD	330 feet	84.01%	87.6%

The mechanical features of design are covered fully in Bulletin 295, which may be had by writing to our nearest branch office.

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BYRON JACKSON CO.

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BYRON JACKSON

CENTRIFUGAL PUMPS FOR EVERY SERVICE

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

10,000 Homes Served by Collection System in Muskegon

APPROXIMATELY 10,000 homes in the city of Muskegon, Mich., are served by the municipal refuse collection system. The cost of operation of the garbage and ash collection department during 1929 was $37,079. During the year there were eight trucks in operation hauling garbage and ashes. Fourteen men are employed in the department, with three men at the incinerator and two men at the dumping-grounds.

The following table shows the amount of garbage, ashes and animals collected during the year by quarters:

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Garbage hauled, loads	1,309	2,557	3,908	1,584	9,358
Ashes hauled, loads	3,228	1,402	....	2,907	7,537
Dogs picked up	119	148	140	126	573
Cats picked up	53	41	47	25	165

I. R. ELLISON,
City Manager.

Winnetka, Ill., Takes Over Collection of Garbage

THE collection of garbage, ashes and rubbish cost Winnetka, Ill., $34,248 during the year ending March 31, 1930, a slight decrease from the 1928 costs. This cost does not include general overhead expenses or fixed charges on equipment. Revenue from householders and business establishments amounted to $36,198.

Garbage and ashes are collected three times a week throughout the year, with the exception of the summer months, when ashes are collected once a week at a charge based on the number of rooms in the residence. A free rubbish collection service is also rendered every other week to every home in the village, and a special daily collection of combustible rubbish from business establishments is given at a fixed charge per month. The above costs also include the service rendered by the village during clean-up month, when practically every sort of rubbish is collected throughout the village if placed on the parkway in accordance with the established schedule.

With the completion of the Glencoe incinerator plant in 1929, the village discontinued the contract method and took over the collection of garbage with its own equipment and employees. Disposal at the Glencoe incinerator is handled under a 10-year contract with that village, whereby each village bears its share of the operating cost and fixed charges. The cost of disposal under this plan for the year was $3.40 per ton. Because of the economies effected by taking over the collection work with our own organization, the total costs for the service are not greatly in excess of those for previous years, with contract collection and disposal for hog feeding and fertilizing.

A substantial improvement in the disposal of household rubbish such as tin cans, bottles and similar waste, as well as rubbish collected from business establishments, was made during the year by the construction at the water and light plant of the first unit of the plan for providing harbor facilities. This project involved the extension of the bulkhead in front of the plant, by means of sheet steel piling and rock fill to a point approximately 450 feet into Lake Michigan. This provides a considerable area for filling, and the rubbish collections of the village are now being dumped there. This will give ample dumping facilities for at least four or five years and will eventually form a valuable part of the harbor project. As funds become available in the future, additional units can be constructed, so that eventually the harbor plan, as covered by the recommendations of the Winnetka Plan Commission, making possible facilities for pleasure boating, will become a reality.

H. L. WOOLHISER,
Village Manager.

Disposal of Street Sweepings in Toronto

IN Toronto, Ont., street sweepings are disposed of by dumping as land fill. Certain shallow areas are used entirely for street dirt. The heavy cleanings in the spring are dumped in ash and rubbish fills.

Many applications are received from residents for this material for garden fertilizer, which is delivered free of charge, the department taking advantage of every application, as it means a short haul and ready disposal of the dirt.

During the fall, when leaves constitute the greatest bulk of the street dirt, difficulty is experienced at the dumps with the vehicles, owing to the spongy nature of the material. The fills are kept as shallow as possible and are built up in layers in order to prevent miring of the vehicles. The Parks Department and several vegetable and flower gardeners request fall cleanings for compost heaps or leaf loam, which takes care of a large quantity of leaves at this time of year.

There are, however, many thousands of yards which can be disposed of only by dumping. During the summer of 1929, 98,878 cubic yards of street sweepings were removed, averaging 12.2 cubic yards per 1,000 square yards per season. A daily average of 24 4-yard wagons, 22 2-yard carts and 2 motor trucks were required in the pick-up service, and 195 patrolmen were constantly in service from April until December.

GEORGE W. DIES,
Street Commissioner.

Worcester Studying Garbage Problem

THE city of Worcester, Mass., has engaged Metcalf & Eddy, consulting engineers, Boston, Mass., to make an investigation of the problem of the disposal of garbage in that city. For many years garbage has been collected by the municipality and fed to hogs on a large farm operated by the city. The number of hogs in 1929 varied from about 4,000 to 6,600. The farm is located on the watershed of Lake Quinsigamond, a large lake used for recreational purposes, and the town of Shrewsbury, which borders the lake, has complained of pollution from the farm.

There is no municipal collection of ashes and rubbish, each householder providing for the disposal of this material individually.

In 1929, the city purchased a Decarie incinerator, having a rated capacity of 60 tons per day. This incinerator is operated by the city, but burns only material delivered to it privately by business houses, hotels and individual householders.

Keansburg Had First Incinerator in Monmouth County, N. J.

THE first plant for the incineration of garbage and rubbish in Monmouth County, N. J., was constructed in the borough of Keansburg in 1920. The plant is still in operation and destroys the full peak load of garbage that is contributed by a large summer population. The plant is of the Morse-Boulger type, constructed in two parts. It has a capacity of 20 tons in 24 hours and in summer is operated usually about 16 hours a day. The cost of the plant was approximately $20,000. Garbage from other communities is not received at this plant.

During a three-day test by representatives of the construction company in September, 1929, garbage and rubbish containing 47.5 per cent moisture were incinerated in the proportion of 26 pounds to one pound of fuel. The cost of incineration was $1.31 per ton, based on costs of labor, fuel and electricity.

A. W. SWEET,
State District Health Officer, Monmouth County, N. J.

Many municipal officials are finding the Garbage Collection and Disposal Statistics published in the 1930 MUNICIPAL INDEX of great value for comparative purposes. These statistics were prepared from original reports from nearly 600 American cities.

Four Stroke Cycle

Fulton's engine building experience extends over a period of more than 75 years—the last 20 of which have been devoted to the perfection and continued improvement of Fulton Diesels.

The four stroke cycle design, originally adopted by Fulton Engineers has proven, by the unusual operating results obtained, to be most desirable because it assures Lower Fuel Consumption...Lower Temperature of the Working Cylinder . . . Longer Life of the Cylinder Liner and Piston . . . Less Oil for Proper Lubrication . . . Lower Mean Bearing Pressures . . . Elimination of Scavenging Pump with its Numerous Valves and Additional Bearings.

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100 TO 2000 HORSE POWER

"Keep Your Streets Clean"

Items on Street Cleaning Problems and Methods

Parked Cars Interfere with Sweeping

THE streets of the downtown business district of Pocatello, Idaho, are flushed each night between midnight and 8 in the morning, as this has been found to be the period when the parked cars are at a minimum. At 6 in the morning laborers with push-brooms sweep the gutter débris into piles, which are loaded into a pick-up truck during the day. Parked automobiles interfere materially with this sweeping and pick-up work, but no way has yet been devised to obviate the trouble, according to J. H. Giles, City Engineer.

Boulder, Colo., cleans its streets by flushing. The gutters are then cleaned by hand sweeping, and the débris is hauled away by truck. In the business district flushing is started at 4:30 A. M. before cars are parked, and the work is continued throughout the residence district during the remainder of the day. H. C. McClintock, Director of Public Service, reports that the gutters are swept without moving parked cars, by working around and underneath them.

The street-cleaning program of Chicago, Ill., is entirely upset on account of lack of appropriations. All machine brooms and flushers have been taken off, with the exception of two in the Loop business district, which are operated at night. Parked cars are a great nuisance and it has not been possible to police the city for this infraction. It is practically impossible to use the machine brooms or flushers because of this, according to Joseph J. Butler, Deputy Superintendent of Streets.

Patrol System of Street Cleaning in Downtown Toronto

THERE are 571 miles of streets in Toronto, Ont., 506 miles of which are paved. Of this paved roadway, 332 miles is asphalt, 94 miles bitulithic, 25 miles brick, 20 miles concrete, and 18 miles asphaltic concrete. The remainder consists of the older types of roadways, some of which were laid for experiment and are gradually being replaced each year with asphalt. The improved street mileage has a total area of 8,137,816 square yards.

The patrol system is used entirely in the downtown section, in business areas and on main thoroughfares. Each patrolman is provided with carrier, set of metal tubs, each with a capacity of 3 cubic feet, push-broom and scraper. As the tubs are filled, the patrolman leaves them at a designated point to be collected. The streets under the patrol system receive constant cleaning and may be covered from two to eight times each day, according to the district.

The remaining section is under the squad system, the men working in pairs followed by a pick-up vehicle. The streets under this system are covered once or twice a week.

The rapidly moving traffic on certain principal thoroughfares conveys all dust and litter into the gutter, thereby reducing the sweeping to gutter cleaning. Here the parked automobile interferes to a great extent with the efficiency of the service. This is particularly noticeable under the squad system, where the sweepers are followed by pick-up vehicles. The sweepings should be removed immediately, but at times, while the loaded vehicles are traveling to and from the dump, vehicular traffic scatters it about again, and some motorists run their cars over several piles before stopping and others park over the pile, thus preventing its removal.

The horse-drawn 4-yard wagon is used for pick-up work in certain sections, while the motor truck is used to the greatest advantage for removing the contents of the patrolmen's tubs. At some locations there are from six to eight tubs to be emptied, with a total capacity of 18 to 24 cubic feet. In the downtown section a 5-ton motor truck is used for collecting the contents of the tubs.

GEORGE W. DIES,
Street Commissioner.

No Time Wasted on Parked Cars in Miami

IN Miami. Fla., 50 per cent of the machine sweeping is done at night, amounting to 50 curb-miles or 25 curb-miles each with two Elgin sweepers. Twenty-five miles of street flushing is also done at night, the men working from 10:30 P.M. to 6 A.M. on both flushing and sweeping. White wings are used in the congested sections for about 18 hours each day. No attempt is made to work the mechanical sweepers in congested sections, but a flusher is used during the early morning hours, and the work is finished with hand brooms.

The parked car seems to have settled down as a permanent fixture, so no time is wasted in trying to remove them. One method, however, is employed occasionally with fair results. This is the use of a printed form in large type containing a personal request from the driver of the sweeper to the driver of the car, asking that the car be not parked at that particular spot within certain hours as "it interferes with my work in cleaning your city." This form is put into cars which are chronic offenders.

Car owners who regularly park their vehicles in front of their homes all night soon find out that if they will leave the car at a slightly different spot each night, say 20 feet from where it was left the night before, the mechanical sweepers can sweep every foot of the curb probably every third time around, so that the gutter does not get into very bad shape.

WILLIAM SYDOW,
Superintendent, Division of Municipal Wastes.

Birmingham, Ala.

BIRMINGHAM, the largest city of Alabama and the leading industrial city of the South, lies in a long, narrow valley at an altitude varying from 700 to 1,045 feet and is protected by mountains to the southeast and northwest. The main streets are wide and most of the buildings are of modern construction.

About 44 linear miles of streets are cleaned daily, using two motor pick-up street sweepers, one double-shift motor flusher, three pick-up trucks, ten double-team dump-wagons, one single-team dump-wagon, and eight hand carts used by white wings. The street-cleaning force consists of 7 salaried men, 37 free laborers and 10 prisoners. The appropriation for street cleaning has been reduced from $56,000 for the years 1928 and 1929, to $48,000 for 1930.

H. H. STRICKLAND,
Superintendent of Streets.

North Tonawanda, N. Y.

NORTH TONAWANDA has a population of approximately 20,000 and is situated on the Niagara River at the western terminus of the State Barge canal, opposite Tonawanda and 11 miles north of Buffalo. It has about 35 miles of streets which are cleaned by one motor pick-up street sweeper, additional trucks being used when necessary. For 1928 and 1929 the street-cleaning appropriation was $3,425, while for 1930 it is only $2,925.

FRANK NIEHOUS,
Superintendent of Public Works.

Prohibit Parking of Cars after One A. M.

IN Fresno, Calif., the problem of parked cars and their interference with street cleaning has been partly solved by the passage of an ordinance prohibiting the parking of cars on the streets after one o'clock in the morning. By arranging the sweeping of the streets so that the business district is swept during the latter part of the night, very little trouble has been experienced.

All street sweeping is done at night by three Elgin sweepers. The only cleaning done during the day is by four pick-up men in the business district.

W. F. RANTSMA,
Deputy Commissioner of Public Works.

PERFECT PROTECTION FOR FOUR YEARS

FIRE DEPARTMENT
EDWARD F. DAHILL
Chief of Dept.

CITY OF NEW BEDFORD
MASSACHUSETTS

July 30, 1930

The Gamewell Company
Newton,
Mass.

Gentlemen:

Ten years ago we installed our first master box connected direct to a sprinkler system. Today we have eighteen Gamewell boxes connected to sprinkler systems and all have given satisfactory service. We have not received a single false alarm from any of these boxes for over four years.

We recommend the installation of Gamewell Master Boxes connected to sprinkler systems.

Yours truly,

Edw. F. Dahill
Chief of Department.

The Gamewell "Sprinkler Watchman" consists of a standard fire alarm box (Master Model). By attaching this box to the municipal fire alarm system on one side and to the riser or risers of a sprinkler system on the other side, the most direct, efficient, and economical sprinkler supervisory service is provided.
A list of cities where the Gamewell "Sprinkler Watchman" is in service will be sent upon request, along with complete details of how the system operates.

"A BOX A BLOCK"

GAMEWELL
SPRINKLER WATCHMAN

THE GAMEWELL COMPANY
NEWTON · · · MASSACHUSETTS

Traffic—Fire—Safety Items

of Interest to Departments of Public Safety

Fire Chiefs to Gather at Winnipeg September 9-12

THE final program of the Winnipeg convention gives promise of one of the most instructive gatherings of the International Association of Fire Chiefs ever held. Among the subjects listed are: Fire Colleges; Administration; Building Inspection and Salvage; Fire Prevention Bureaus; Oil Fires; Refrigeration; Underwriters' Formulas; and many other technical matters.

Simultaneously with the issuance of the convention program, the Proceedings of the Birmingham convention of October 22 to 25, 1929, have been published. Application for this volume of 310 pages should be made to the Secretary of the Association, James J. Mulcahey, Chief of Fire Department, Yonkers, N. Y.

Safety Congress to Discuss Street and Highway Traffic Problems

PUBLIC safety sessions of exceptional interest and value are indicated in the program of the Nineteenth Annual Safety Congress, to be held in Pittsburgh, Pa., September 29 to October 3, by the National Safety Council. In addition to a General Public Safety Session there will be a series of meetings during the week of the Street and Highway Traffic Section, at which the subjects to be discussed will include: Traffic Accident Records; Protecting the Child; The School Boy Patrol; Enforcement Methods; Administration and Engineering Problems; and Uniformity.

There will also be a series of breakfast conferences to take the form of a traffic school, at which Ernest P. Goodrich will preside. The school will discuss Regulation of Parking, Traffic Signals, Accident Records, and Public Interest in Traffic.

Los Angeles' New Bureau of Street Traffic Engineering

RECOGNIZING the need for a unified handling of the highly technical problems of traffic control, the city of Los Angeles has just created a Bureau of Street Traffic Engineering in its Police Department. The nucleus of the new unit is the Traffic Signal Division, which the ordinance transfers from the Building and Safety Department to the jurisdiction of the Board of Police Commissioners. The Bureau is not only given charge of all physical and electrical equipment used in handling street traffic, but it is directed to conduct studies of accidents, congestion, and the safe and convenient uses of streets. The Police Board is empowered to pass emergency regulations concerning parking, routing and other uses of the streets. These continue in force for thirty days. The City Council is thus given opportunity to consider their working and give them permanent effect. The new ordinance was sponsored by the Los Angeles Traffic Association, which estimates that it will result in the saving of many thousands of dollars to the city, both in the elimination of duplications and the more expeditious and effective handling of traffic.

Efforts of States to Control Parking

THE seemingly barren pages of statute law present more graphic sources of history than military, political or literary records, according to Margaret W. Stewart, who is the official in charge of the States Law Index of the Legislative Reference Service, Library of Congress, Washington, D. C., who says:

"The actual living conditions of a people sooner or later find expression in their laws. As parking problems loom large in the thoughts of the citizens of the states, so do they in the output of the state legislature."

Highlights on the present status of the parking problem are reported by Miss Stewart in a recent issue of the *United States Daily*. To quote further:

"A recent law of California authorizes cities, towns and counties to permit the use of public property for parking and to construct 'driveways, floor, stalls, sheds, fences, buildings or other structures.'

"Indiana declares that, in order 'to prevent the obstruction or incumbrance of any street, alley or other public place with vehicles so as to impede the free use of the same for its proper purpose,' cities are authorized to operate municipal parking grounds.

"Michigan provides that cities may operate facilities for storage and parking of vehicles, 'including the fixing and collection of charges for services and use thereof on a public utility basis.'

"New York amends a provision of the village law which once provided only for the maintenance of hack stands, to include parking places."

But to indicate that not all public problems that are news are new, she adds:

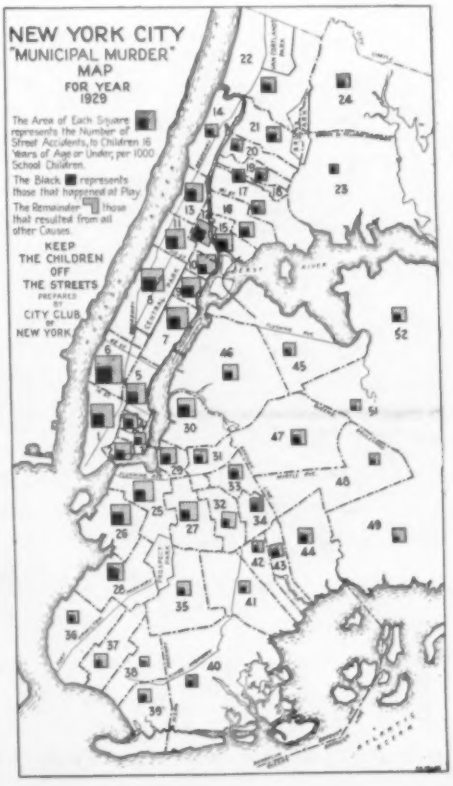
"To those who assume that parking problems are new, however, the records show that a pre-revolutionary merchant of Philadelphia forestalled the modern department store, which bids for trade by providing parking spaces. An advertisement of August 20, 1773, announces that:

" 'Anthony Fortune, at the Fountain and Three Tuns, Chestnut Street, between Second and Third Streets, Philadelphia, begs leave to inform his friends and customers in particular, and the public, in general, that he has now opened a large and commodious passage from Chestnut to Market Street by way of Elbow-Lane, sufficient for carriages of any kind to drive up into his yard where he has fitted up commodious stables capable of receiving sixty horses with coaches and chaises. Houses and gates under lock for safety.' "

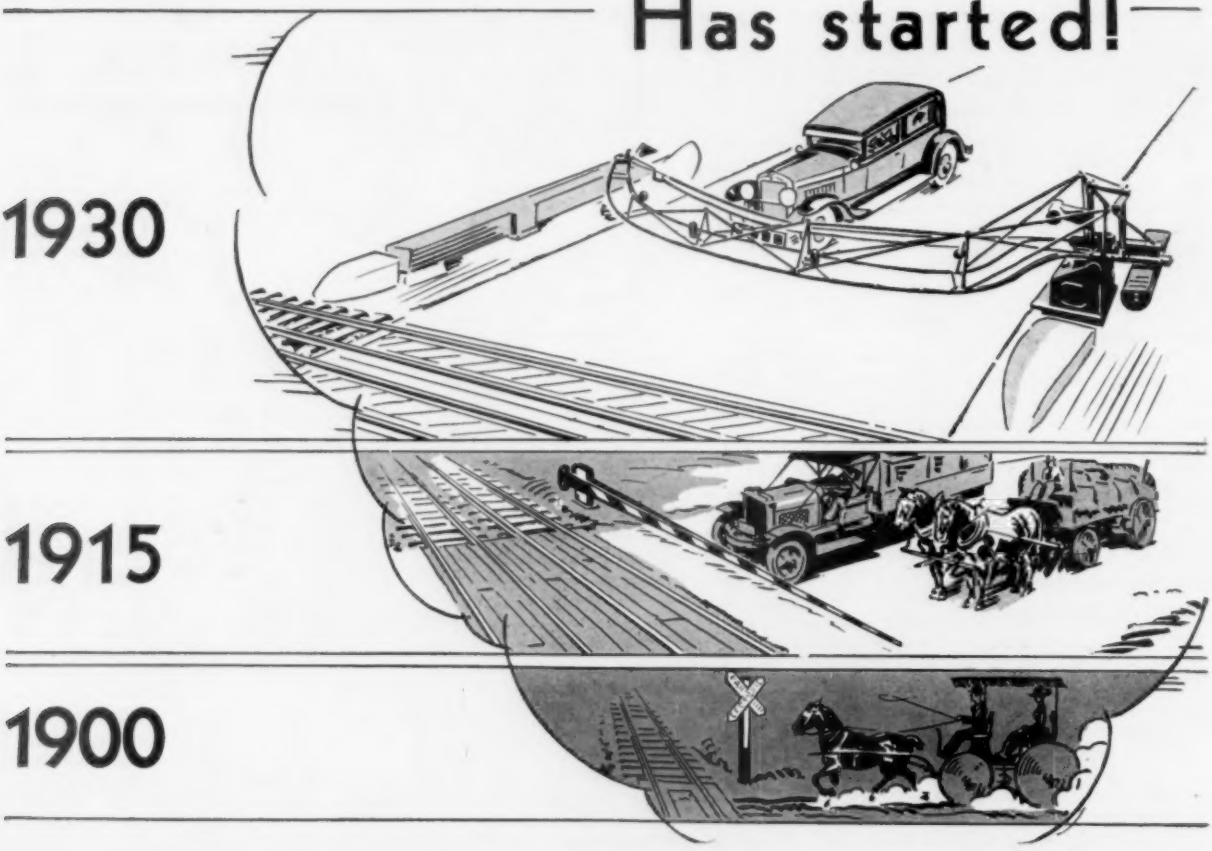
Municipal Murders Increased by Play-Space Shortage

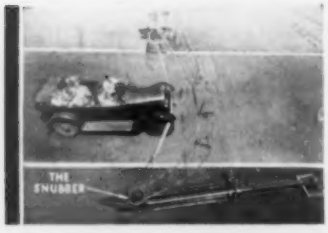
A TOTAL of 13,998 children were killed or injured in street accidents in New York City during 1929. Of these, 9,623 were under 11 years of age. Of the total, 340 were killed outright, 263 of them under 11 years of age. In the latest edition of its Municipal Murder Map,* The City Club of New York shows the location of these accidents by school districts and the number that occurred while the children were at play. The map is reproduced on the cover of the Club's July *Bulletin*, which is largely devoted to statistical analyses of the figures and to the needs for adequate play space.

* THE AMERICAN CITY, October, 1928, page 87.


NEW YORK CITY
"MUNICIPAL MURDER"
MAP
FOR YEAR
1929
The Area of Each Square represents the Number of Street Accidents, to Children 16 Years of Age or Under, per 1000 School Children.
The Black ■ represents those that happened at Play
The Remainder ▭ Those that resulted from all other Causes
KEEP THE CHILDREN OFF THE STREETS
PREPARED BY CITY CLUB OF NEW YORK

An ERA of GREATER SAFETY Has started!





At the moment of contact with the barrier the wire rope gives an even bearing against the car. The snubber has not started to act.

Compare the position of the snubber in this picture with its position in the illustration above. Here the snubber has moved to take up the shock.

NOT until the introduction of THE HIGHWAY GUARDIAN was there an economical means of securing complete protection at grade crossings. But now with this reliable safeguard available at a cost that is reasonable, a new era in crossing safety has been made possible.

Where a few grade separations were formerly constructed, appropriations similar in amount will now provide complete protection for both motorists and railroads at a great many grade crossings. Without delay bad crossings can be made safe and the railroads saved from the consequences of fatal accidents.

THE HIGHWAY GUARDIAN forcibly detains the motorist who takes chances. Its automatically operated barrier of steel stops on-coming vehicles. A powerful snubber slows down the speed, then gradually overcomes all forward motion within a definite distance. Lives are saved, car wreckage prevented and damage claims made a thing of the past.

Such safety as THE HIGHWAY GUARDIAN provides not only stops crossing fatalities but also prevents train delays and damage to railroad equipment and roadbed. Write for complete details.

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THE CROSSING GATE THE MOTORIST CANNOT CRASH

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Fire Chief, Griffen, Ga.
(Appointed 1920)

PAUL F. DOLAN
Fire Chief, Cedar Rapids, Iowa
(Appointed 1927)

ANTHONY J. SALIMONE
Police Chief, Park Ridge, N. J.
(Appointed 1928)

Who's Who in Public Safety

The 33rd of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

D. E. SOX
Fire Chief, Coral Gables, Fla.
(Appointed 1928)

WILLIAM H. IRWIN
Police Chief, Elberton, Ga.
(Appointed 1898)

E. F. BEVILLE
Fire Chief, Gainesville, Fla.
(Appointed 1921)

HERB NOURSE
Police Chief, Esterville, Iowa
(Appointed 1927)

R. H. NOEL
Police Chief, St. Petersburg, Fla.
(Appointed 1929)

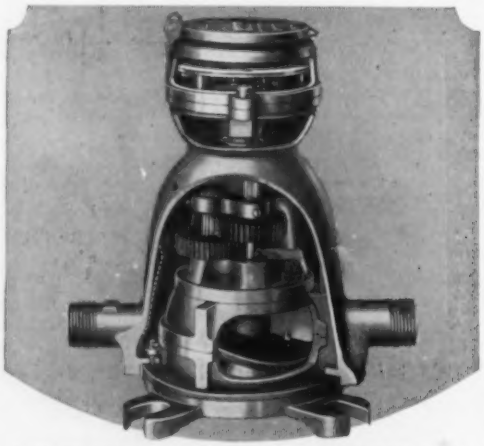
M. N. CLEVELAND
Fire Chief, Sanford, Fla.
(Appointed 1925)

WRIGHT HEDGES
Fire Chief, Atlantic, Iowa
(Appointed 1927)

F. O. FLOWERS
Fire Chief, Rock Hill, S. C.
(Appointed 1903)

FRANK H. MATTHEWS
Fire Chief, W. Palm Beach, Fla.
(Appointed 1929)

When you specify the products of Union Water Meter Company you gain the benefit of more than sixty years progressive experience in this highly specialized industry.



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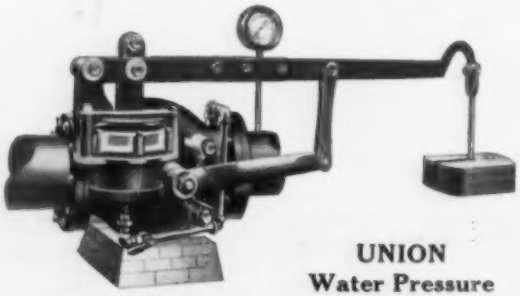
King F. P. Meter overcomes weaknesses heretofore evidenced in meters of this type. It is of the direct outlet, positive measuring, self-draining type. It combines strength, simplicity and accuracy under varying service conditions.

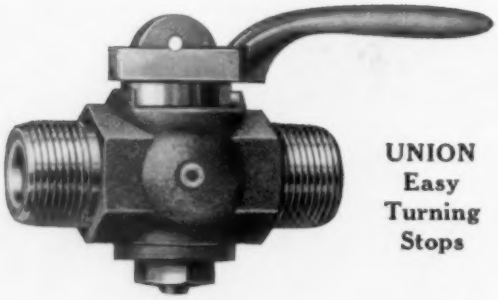
This meter is also furnished with split case (King S. C.) for use in locations where frost protection is not necessary. Interior parts of King S. C. Meter are interchangeable with those of King F. P. Meter.



UNION Water Pressure Regulators and Altitude Valves

Union Water Pressure Regulators and Altitude Valves are absolutely automatic, depending in no way on springs, which in time become crystallized and set, for their action. The operating valve has iron body, with bronze lining and bronze stem, giving all the advantages of a bronze valve at a fraction of the cost.

Union Water Meter Company takes this opportunity to welcome you cordially to the New England Water Works Convention.



UNION Easy Turning Stops

Union Easy Turning Stops are made of the very highest grade bronze composition. Every stop is hand ground to perfect bearing. They will turn easily always. Built solid except for necessary water way. Every stop is tested under 250 lb. water pressure before shipment.

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SEPTEMBER, 1930
Vol. XLIII, No. 3

The American City

470 Fourth Avenue
New York
50 Cents, $4 a Year

Twenty-one Years of Municipal Progress

1909 - 1930

GREAT cities have existed in the civilized world for two thousand years and more, but the great cities of the past have been agglomerations. Today we are looking at our cities—and even our metropolitan regions—as institutional entities. They are regarded as having a natural history. It is now appreciated that to function properly they must be intelligently planned and organized. To this viewpoint the last two decades have made generous contribution.

Perhaps the most significant current movement, one belonging almost entirely to the period since this magazine was established, is the development of city planning and its hand-maiden, zoning. No longer regarded as genteel interest in public esthetics, city and regional planning is seen to have a deep economic and social significance. Eight hundred and seventy-four cities, towns and villages have zoned their areas, and planning commissions are more or less busy in some seven hundred communities.

The science of municipal administration has emerged during this era. The council-manager plan of city government is the latest, if not the last word, in municipal organization. The trained administrator is replacing the ward boss's selections in city departments. Side by side with this emphasis on improved organization and technique have gone developments in public budgeting and auditing that hold the key not only to substantial economy, but to improved organization and efficiency.

WITH each passing year more is asked of our city governments. The last twenty-one years have been an era of new things. The automobile, the motion picture, the radio, and the airplane have brought many changes to American life. This period has been particularly dominated by the automobile, just as the next similar period is likely to be dominated by the airplane. The automobile, growing since 1909 from about 300,000 to 27,000,000 in registration, has brought effective demand for better street and highway paving. This is easier to clean, and great strides have been made in municipal housekeeping, including not only the collection of municipal wastes of all kinds, but their economical and sanitary disposal. Streets are also better lighted, so much so that many of our cities are likely soon to prohibit the automobile headlight on their well-illuminated thoroughfares. The motor vehicle has brought with it the parking problem and a distressing toll of accidents and death.

With the shorter work-day and work-week, and the continued migration from the farms to the cities, have come greater needs for public provision for outdoor play and for quiet communion with nature—needs in the meeting of which inspiring progress can be recorded. Growth and congestion of population have also brought to our fire and police departments increased problems which are being met with added efficiency and freedom from "politics." Another effect of our pyramiding populations has been the reaching out farther and farther for adequate water supplies, and greater attention to their proper purification and sterilization.

THE cities of America have many tasks before them. City planning calls for bolder handling than has yet been attempted—with much greater emphasis on spaciousness of development and on departure from horse-drawn tradition in street and highway design, than has yet become general. Housing remains a challenge that few cities have had the courage to face. Public health is making steady advance but much remains to be done, while only the merest beginnings have been made in adequate programs of street and highway safety. Perhaps the most encouraging sign in these and other fields of municipal endeavor is the growing appreciation of the importance of trained technicians and administrators. With more of such officials in command, the public-utility problem also, which has long plagued municipal and state authorities, can be more boldly faced, with increased confidence in the city's ability to serve itself.

The achievements of the years 1909 to 1930 have been substantial. It is encouraging to feel that THE AMERICAN CITY has shared in the progress that is recorded in the series of articles which follow, and in some measure has helped to promote it. One criticism that is sometimes, and fairly, leveled against municipal government is the failure to consolidate experience. The absence of national or state control, the failure to treat municipal administration as a career, have been in part responsible. THE AMERICAN CITY aims, in part, to offer the answer. It has endeavored during the first twenty-one years of its existence to make available for all the best that was being done everywhere, thus helping to apply to municipalities and counties the philosopher's dictum that if we can do everywhere what is now being done with success somewhere, the world will be remade.

Twenty-One Years of Progress in Water-Supply and Purification Practice

By NICHOLAS S. HILL, JR.
Consulting Engineer, New York

THE changes in water-supply and purification practice during the past twenty-one years have been so numerous that it is possible, in a short article, to do little more than mention the more important of them.

During this period advances in the general field of steam-electric power generation, distribution and utilization have been marked. Higher steam pressures, up to 1,450 pounds, temperatures up to 840°, the growing use of pulverized fuel, corresponding changes in boilers and settings, and improvements in auxiliaries, have increased efficiencies and made possible great savings in the machinery room. In the last ten years, the average fuel consumption per kilowatt-hour for central power-plants in the United States has been cut in half.

Advance in Pump Design

Progress in central power-station design and operation is reflected in that of the water-works pumping-plant. Twenty-one years ago the typical station was equipped with slow-speed, reciprocating pumping-engines using saturated or slightly superheated steam generated at 80 or 150 pounds pressure. Figure 1 illustrates one type. The pumps shown are Snow cross-compound reciprocating units of four milion gallons daily capacity each.

In the modern station, centrifugal pumps have largely superseded reciprocating units, owing to low first cost, small space occupied, and the high efficiencies now obtainable. In twenty-one years the centrifugal pumping capacity in the United States has grown from 10 per cent to over 66 2/3 per cent. The range of sizes and pressures is not exceeded by any mechanical device. Maximum efficiencies for the pump alone reach 90 per cent.

The modern motive power is the steam turbine, fitted with complete condensing equipment and employing relatively high steam pressure and a good degree of superheat; or the synchronous motor, with its high efficiency, controlled power factor, and constant speed, using high-voltage current from a central power-station. Other developments include oil-fired boilers and diesel and oil engines for the prime movers. Figure 2 illustrates a common type. It shows two 10- and one 5-million-gallon-daily steam-turbine-driven centrifugal unit using steam at 250 pounds pressure and 100° superheat generated in oil-fired boilers.

Improvements in water-works pumping practice have been so marked that appreciable savings usually may be effected by careful study of any station ten or more years old.

Twenty-one years ago the typical ground water-supply consisted of infiltration galleries, tile collectors, or groups of 4 to 10-inch wells surrounding a central pumping-station. The wells, when not artesian, were pumped by direct suction or by air, and the capacity of the source was often limited by the small radius of influence and possible drawdown.

Recent years have seen a marked development of isolated wells of greater diameter and yield, equipped with motor-driven deep-well pumps. The pumps may discharge into receiving-basins at the central pumping-station, thus widening the zone of influence in a simpler and more efficient way than the older air-lift system; or, where sanitary and ground-water conditions are favorable, may pump directly to distribution from widely distributed points, still further enlarging the field and effecting economies in pipe sizes due to the proximity of source to point of use. The equipment may be housed in small structures of attractive appearance, as illustrated by the individual well station in Figure 3.

Other Notable Advances

Motor-operated pumpers have made it less necessary for small communities to have the large mains formerly required for satisfactory fire service direct from the hydrant. Centrifugally cast iron pipe possessing greater strength for the same thickness of shell; cement-lined cast iron pipe and concrete pressure pipe possessing higher frictional coefficients and better-sustained carrying capacity; materials other than lead for joints, and flexible copper tubing for service connections, are other developments.

Increased efforts to control waste through pitometer surveys, waste prevention campaigns and universal metering have deferred capital expenditures.

Physical, chemical and sanitary standards are higher now than formerly, and great improvements have been made in the art of water treatment. The proportion of unfiltered surface supplies has decreased, and more attention is given to the sanitary control and protection and reforestation of watersheds.

Mechanical filtration plants have increased as compared with the earlier slow sand filters, because of lower first cost and their adaptability to the employment of chemical treatment processes. An example of a modern filter gallery is shown in Figure 4.

The sterilization of public supplies with liquid chlorine is a modern development, although now common prac-

tice. Chloramines have also been studied and used for sterilization.

Much attention is now given to the removal of tastes and odors in water, with particular reference to those produced by phenolic compounds. Measures employed include aeration before and after filtration, super-chlorination followed by dechlorination, pre-ammoniation, use of potassium permanganate, and treatment with activated carbon.

Water softening received an impetus with the introduction of mechanical filtration. Methods include the excess lime treatment followed by re-carbonation, the Zeolite process, and combinations of the two. Recent improvements include clarifiers to remove sludge, and recirculating part of the sludge.

Improved Filter-Plant Operation

Mechanical filter-plant design has been standardized and operation simplified, careful studies made of the chemistry of reactions in the coagulating basin, methods of measuring the pH developed, and the reaction controlled so that coagulation takes place at the optimum point.

Mechanical clarifiers before and after addition of chemicals are now used. Accurate dry feed machines have been developed. Mixing tanks are a recognized part of properly designed plants. Mechanical stirrers and the hydraulic jump are recent additions. Double coagulation is practiced where loads are heavy.

Filter wash-water rates have been increased to from 24 to 33-inch rise per minute. Double filtration, although advocated, has not gained much headway, but mechanical pre-filters have been added to many slow sand plants.

Standardization

A review of progress, however brief, would be incomplete without mentioning the standardization of practice brought about through the agency of water-works associations, underwriter agencies, and public utility commissions in the past twenty-one years, as well as the effect of recent widespread grouping of privately owned water-plants under a single management.

IMPROVEMENTS IN WATER-WORKS PLANTS

1. Pump-room containing reciprocating units of 4 million gallons daily capacity each at the East Orange, N. J., water-works. 2. A modern pump-room of 25 million gallons daily capacity at the Tampa, Fla., water-works. 3. An individual well station at the East Orange water-works. 4. A modern filter gallery at the Tampa water-works

The Last Two Decades in Highway Design, Construction and Maintenance

By CHARLES M. UPHAM
Engineer-Director,
American Road Builders' Association

THERE are three names that stand out prominently in the early history of highway building—Tresaguet, MacAdam and Telford.

Tresaguet, born in 1716 in France, recognized the necessity for continued maintenance, and did much to reduce costs and improve methods of construction. He was a great engineer and may well be called the father of road building.

John Loudon MacAdam was born in Scotland in 1756 and developed the pavement which bears his name. Thomas Telford was born in Scotland in 1757 and devised the base construction known throughout the world as Telford base. These two engineers differed somewhat in their methods, Telford paying particular attention to a foundation of broken stone, while MacAdam disregarded it, contending that the subgrade, however bad, would carry weight if properly drained and kept dry by an impervious covering. These two engineers were among the first to utilize scientific principles in highway construction and maintenance.

Early History in United States

During the early periods of highway building in this country, construction and maintenance operations were essentially local in character, labor being furnished by community residents, and financing accomplished by funds from local treasuries. This system, without centralized supervision, sufficient funds, or skilled labor, practically eliminated construction of a permanent nature with the result that very little development occurred.

The first step in administration improvement occurred with the organization of a State Highway Department in New Jersey in 1891, followed closely by Massachusetts in 1892, Connecticut in 1895, and New York in 1898.

Early Road Types

Untreated gravel and macadam were prevailing types of surfacing prior to 1904 and were adequate for the normal flow of horse-drawn traffic. About this time motor-vehicle traffic became a factor, and the impracticability of these types for traffic of this nature soon became evident.

The weaker bindings of clay and water were replaced with tars and asphalts, first as dust layers, then for penetration purposes, and later premixed types were developed.

Before the use of these materials had become prevalent, soil studies had been carried on by the Bureau of Public Roads for the purpose of securing the best results from surfacing by means of sand-clay, gravel and gumbo. Experiments were tried, using various mixtures. Sand-clay roads in the South were well adapted for light traffic, and it was found that by burning clay to a point where its plastic qualities were destroyed, it could be used successfully as a road surfacing under the same conditions. Gumbo was found to react in much the same manner and was used extensively in the Mississippi valley and in tributary states. Suitable mixtures of sand and clay are still serviceable under light traffic and are economical where materials can be obtained locally.

Dust Prevention—Bituminous Surfaces

Prior to 1908, oils, tars, asphalt and salt solution had been used principally as dust preventives only, the application in most instances being made on old surfaces. About this time, experiments were made to determine the utility of these materials incorporated as binders in newly constructed or reconstructed surfacing. Hot dry aggregates coated with hot bituminous material and rolled in compaction on macadam base were successfully tried in 1908 and 1909. The bituminous materials included asphaltic preparations, refined water-gas tar, residual oil, coal tar, oil emulsions, and mixtures of molasses, oil and lime.

The pressure distributor had not appeared in this country up to 1910, although there were several types in operation in France and England. Oil spreading in this country was accomplished either by hand-pouring pots or by gravity distributors, horse-drawn.

The greatest bituminous development came between 1904 and 1914. In 1904 there were only 18 miles of bituminous rural roads in this country, this mileage being in Ohio and Massachusetts, while in 1914 there were 10,500 miles of this type.

Bituminous Concrete—Bituminous Macadam

The penetration macadam surface was developed during this period. It was found that by using suitable crushed stone as a base and by applying hot bitumen under pressure, a surface could be constructed which would successfully withstand the wear and tear of motor-vehicle traffic.

It was also found that waterbound macadam could be successfully treated if bitumen of the right consistency were used and the surface properly cleaned. Many miles of waterbound macadam in New England, substantially built years ago, have been preserved by this method and with the aid of an occasional bituminous application will continue in service for years to come.

Penetration macadam and surface-treated waterbound macadam are popular types of construction in many parts

of this country at the present time.

Many bituminous mixtures have been developed, in recent years, for road surfacing. This classification includes several patented types of paving. The early attempts at mixing bitumen with stone aggregates were extremely primitive compared with present-day methods and consisted of spreading hot stone on a wooden platform, covering it with asphalt or tar and turning with long-handled forks.

Sand-asphalt was one of the earlier developments and was the result of experimental work carried on at Cape Cod, Mass. There are other mixtures of a similar character, varying in size of aggregate and type of binding material, many of which are patented and are popularly known by trade names.

Bituminous concrete construction has reached its present perfection by reason of improved construction methods. Plants for accurately mixing and measuring the mixtures have been developed through scientific research.

In 1908, extensive experiments were made with natural rock asphalt as a surfacing for macadam bases. These were generally successful, and with the development of scientific means of crushing and securing uniformity of bitumen content, this material has become increasingly valuable for road-surfacing. Owing to transportation costs, however, the economic use of this material is limited largly to local use.

The demand for highway improvement in rural districts has recently resulted in much research concerning the bituminous treatment of various kinds of soil surfaces. Several states are utilizing such methods on the lesser-traveled highways with success. This low-cost improvement serves its purpose until the demands of traffic require replacement by higher types. It has not curtailed the construction of higher type surfaces but is a preliminary step in the progressive construction of highways.

Rigid Type Pavements

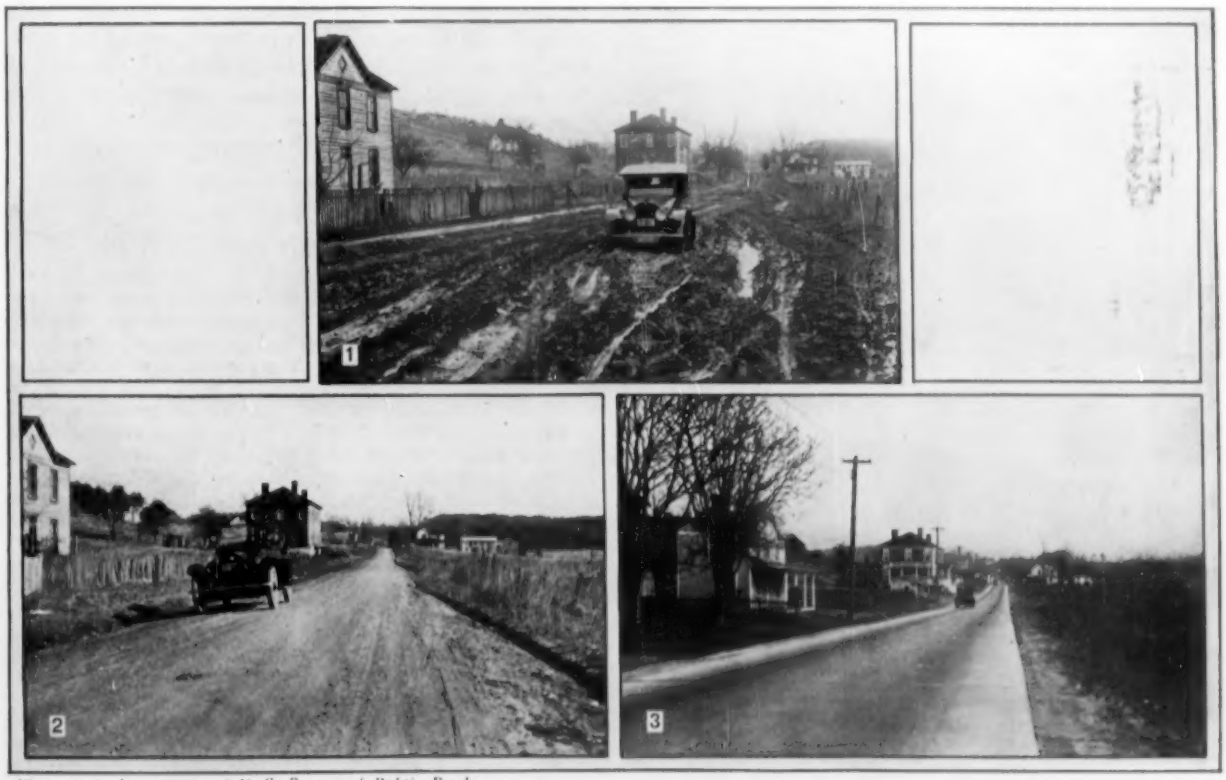
The advent of motor trucks in large numbers furnished a demand for more rigid pavements such as portland cement concrete, and brick or bituminous concrete on a portland cement concrete base.

Portland cement concrete was first used as a base in New York in 1888. It was first used as a finished pavement in Wichita, Kans., being laid as a patented pavement known as Jasperite, which was not successful. The first successful construction of this type occurred in Bellefontaine, Ohio, in 1892 and consisted of a strip of concrete 10 feet wide in front of the Court House.

The first standard specifications were compiled in 1909 by the National Association of Cement Users, but the first important construction did not occur until 1912, when 250 miles of rural highways were built.

The early specifications were necessarily crude compared with those of today and required the construction of a two-course pavement. Small mixing units and hand labor curtailed production and resulted in uneven surfaces of poor quality when compared with those of today.

Production increased with the development of machinery. Prior to 1919, a two-sack paving mixer could lay a maximum of about 600 feet of 18-foot pavement, averaging 7 inches in thickness. In 1919 a Michigan contractor laid 1,000 feet of concrete, 16 feet in width, in 8 hours and established a record. A number of contracts



Photographs by courtesy of U. S. Bureau of Public Roads

PROGRESS IN ROAD CONSTRUCTION SHOWN PICTORIALLY

1. This muddy, unimproved road made travel decidedly difficult. 2. Travel was greatly facilitated on this same road by surfacing with gravel. 3. The identical section when improved with concrete through Federal aid reduced transportation costs to a minimum

in 1920 ran well over this figure. In 1923 a record of 2,017 feet of 18-foot concrete in a day was announced by the Illinois Division of Highways, a seven-bag mixer being utilized.

The construction of this type has been steadily increasing and the production figures for 1928 give a total mileage of 7,000 miles of new concrete paving for that year on state and county systems. This is a striking contrast to the 250 miles laid in 1912.

It is interesting to note some of the early specification requirements. Coarse aggregate requirements had a much smaller maximum size than the specification of today. Machine mixing was preferred, "since a more thorough and uniform consistency can thus be obtained." Wood forms were specified and no mention of reinforcement appeared.

The early pavements were susceptible to frost action, cracked badly and distintegrated under impact. In the modern pavement the above-named disadvantages are eliminated owing to improvement in proportioning and predetermined high-strength economical combinations of aggregate and water.

Earth Moving and Maintenance

The change in grading methods over a twenty-one-year period has been revolutionary. The development of automotive power has been a most important factor in this change and has accounted for the supplanting of all types of horse-drawn equipment by tractors and trucks. Hand excavation, largely by shovels and later by drags, has been replaced by power shovels and motor-driven elevating graders.

Maintenance methods have changed from the use of horse-drawn split-log drag and primitive blader to the highly developed road machine and maintainer. The truck and tractor have been a big factor in this evolution.

GOOD ROADS HAVE CONTRIBUTED MUCH TO EDUCATION

1. In the old days the children walked over muddy roads to nearby rural schools. 2. Now the school bus transports the pupils over comparatively long distances to modern consolidated schools

Conclusion

The development of the highway in this country has resulted from a pressing demand for better and cheaper transportation. The improvement in methods, materials, and equipment is the result of scientific research and field experience. Increased production, improvement in quality, and lowered costs have developed.

Road building is no longer a means of keeping convict gangs at work. It has gained the reputation of a profession requiring the highest degree of skill, thought, and integrity.

Financing of highways has changed radically since the advent of the automobile. The popular shifting of the tax burden from the landowner to the user of the highway has relieved the local taxpayer of financing through-highways and has resulted in making huge sums of money available for development of these systems.

The following figures indicate the rapid increase in highway mileage during the last twenty-one years.

At the end of 1909 there were 2,200,000 miles of state and county highways, of which there were surfaced 190,400 miles, which is 8 per cent of the total. This figure includes 59,000 miles of untreated stone (macadam) construction, 102,800 miles of gravel, 28,300 miles of sand-clay, brick, bituminous macadam and other improved surfaces. There was no portland cement concrete reported.

At the end of 1928 there were approximately 3,000,000 miles of state and county highways, of which there were surfaced 626,000 miles, which is 20 per cent of the total. The latter figure includes approximately 165,000 miles of portland cement concrete, asphaltic concrete and other bituminous mixtures, brick and stone block, as well as 435,000 miles of treated and untreated waterbound macadam, gravel, etc.

PAVEMENTS AND POPULATION

WHAT effect does roadbuilding have on census figures? The Portland Cement Association calls attention to the fact that statistics from the four southern states, Virginia, North Carolina, South Carolina and Georgia, indicate a direct relationship between the two. The population of North Carolina increased by 23.9 per cent since 1920. Virginia, South Carolina and Georgia, although showing an average gain of 11 per cent from 1919 to 1920, only gained an average of 2.8 per cent since 1920. North Carolina is the only one of the four to do any extensive roadbuilding in the last decade; $150,000,000 of bond money has been expended. Georgia (with a population gain of 0.2 per cent since 1920) has so far refused the bond-issue plan, fearing that excessive taxes would result. South Carolina is about to start a roadbuilding program with the proceeds from a $5,000,000 bond issue.

Economic conditions in North Carolina are generally believed to be much better than in the other three states named. Farmers have been able to diversify crops because pavements have given them quick marketing of perishable produce. People and goods alike can move about more readily, to the mutual advantage of different sections. Consolidated schools, with children quickly hauled long distances by bus, have materially helped to reduce the illiteracy records. The operating cost of motoring in North Carolina has been reduced very substantially, so that taxation for good roads, the early building of which can be considered as largely responsible for the state's advancement, becomes a painless process.

Refuse Collection and Disposal—Twenty-One Years of Progress

By H. BURDETT CLEVELAND
Consulting Sanitary Engineer, New York City

THE AMERICAN CITY has grown to its majority during a period which may be said to embrace the development of refuse collection and disposal in America along technical lines. Comprehensive investigation of the subject was started in this country in 1887 through a committee of the American Public Health Association of which Dr. Rudolph Hering was chairman, but the predominant trend of design and construction of today had not been established by 1909, and up to that time only eight or ten reduction plants and about an equal number of large garbage furnaces and refuse incinerators had been built in America.

At present, based on the very complete tabulation in the 1930 Municipal Index, there are nearly 300 refuse incinerators in operation in the United States and about 15 reduction plants.

Of special interest during this period of development has been the gradual trend of practice away from reduction or utilization methods of garbage disposal, such as grease extraction and hog feeding, and toward incineration as being the most satisfactory and sanitary method and, at locations where lowered collection costs result, the most economical system to adopt.

One of the principal reasons for the general abandonment of reduction or grease recovery has been the fluctuation in price and the uncertainty of a market for both grease and tankage.

Coincident with the development during this period of this branch of engineering in both project study and design and as a result of a better understanding of the difficulties to be met, there has grown up a conviction on the part of most people concerned that refuse collection and disposal is a problem whose economical and satisfactory solution for each municipality can be reached in no other way than through independent engineering investigation and design.

Collection Practice

Collection practice has advanced from haphazard, uncontrolled private, and occasionally licensed, collection in most municipalities where systematic collection of any sort at all was attempted, to numerous instances of carefully worked-out systems, with proper account taken of such factors in economic delivery of refuse to disposal points as routing of collection wagons, type and capacity of collection units, length of haul, transfer problems, and varying characteristics of different municipalities and of different districts as affecting trip program, collection points and quantity expected.

Without doubt, one important consideration which has brought about the general adoption of incineration instead of reduction or hog feeding in new projects of recent years is the fact that collection costs often amount to three or four times disposal costs, and these costs are more readily reduced, by shortening hauls to disposal plants, than plant operation costs. With the successful development of furnaces for burning mixed refuse at high temperatures without odor and dust creation, it has been possible to locate and operate high-temperature incinerators without nuisance in built-up districts where reduction plants would not and could not be tolerated. Thus the cost of haul to incinerators at such points has been much less than would have resulted if garbage had to be conveyed to reduction plants or hog farms at considerable distances from collection areas.

Development of Incineration

Another feature of incineration which has led to its general adoption is that both garbage and rubbish can be disposed of in one operation, thus avoiding the construction of separate plants and doing away with the necessity of separate collections.

While there had been built in this country prior to 1909 a few satisfactory garbage furnaces operating at low temperature with auxiliary fuel, the first successful plant to be built in America for the incineration at high temperature of refuse, or combined garbage and rubbish, was constructed at Westmount, a suburb of Montreal, in 1906. The construction of other plants of this type, embodying the adaptation of the English type of high-temperature destructor to American conditions, followed at Vancouver, Seattle, West New Brighton on Staten Island, Milwaukee, and Buffalo. From 1906 to 1914, 24 high-temperature refuse incinerators were installed in American cities. Among these were plants at Clifton, N. Y.; Paterson, N. J.; Savannah and Atlanta, Ga.; Toronto and Ottawa, Ont.; Montgomery, Ala.; El Paso, Texas; Portland, Ore., and San Francisco.

The earlier plants were hand-charged, but since 1910 mechanical charging devices have been successfully developed and have been employed at the larger plants.

Utilization of the heat developed by the production of steam has not been found advantageous or desirable at most incinerators, principally on account of the lack of a ready market for surplus power and the intermittent nature of the supply of the product, steam or electric current.

Within the past year or two, sewage-sludge cake and screenings have been more generally included with rubbish and garbage as classes of municipal waste to be dis-

posed of by incineration, and several extensive sewage treatment projects provide for the incineration of such wastes, either separately or at refuse incinerators.

Costs of Disposal Plants

In common with the cost of other engineering and municipal works, construction costs of refuse disposal plants have nearly doubled since before the World War. From 1910 to 1914 the general range of cost for refuse incinerators per ton of refuse-burning capacity per 24 hours was from $600 to $1,000, depending on the size of the plant. These costs may be roughly assumed at from $1,000 to $1,500 at present under ordinary conditions. Operation costs have not increased, principally because of improvements in design of incinerators, and may range from $0.75 to $1.50 per ton of refuse.

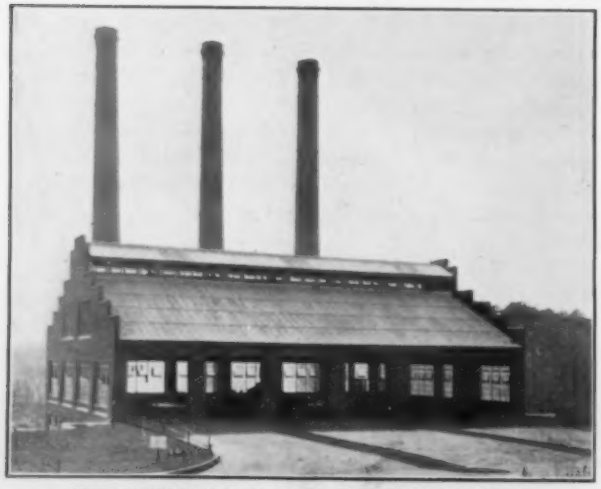
Pertinent Comments

There is considerable room for improvement in this branch of sanitary engineering construction. Too much high-power salesmanship and too little engineering analysis of projects are still apparent, but a sounder basis for progress is being developed.

One of the most important and logical developments in this field is the provision being made by the establishment of sanitary districts and by cooperative action of municipalities for joint disposal projects. This movement will result, in many districts, in greater economy by avoiding duplication of plants and reducing operating costs, in the minimizing of nuisance conditions, and in the preservation of real estate values.

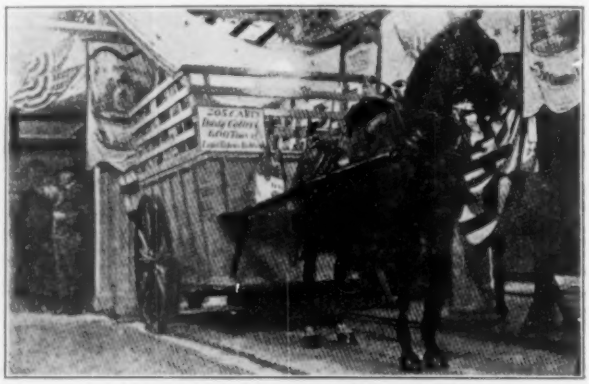
Considerable impetus has been given to refuse incineration construction in recent years by the effective, sanitary and economical operation of the modern, high-temperature incinerator, and it is estimated that about one-half the plants in operation have been constructed during the last four years.

THE GARBAGE AND REFUSE INCINERATOR AT RUMSON, N. J., SHOWING THE CONCRETE RAMP TO THE DUMPING FLOOR



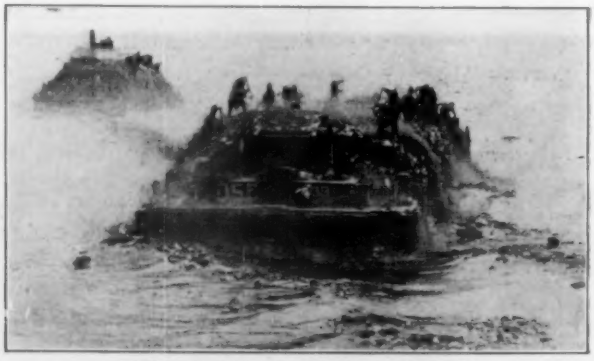
THE CHARLOTTE, N. C., REFUSE INCINERATOR, CONSISTING OF SIX 60-TON UNITS IN THREE BATTERIES
Note that the need of a ramp is eliminated by the hillside construction

SOME PICTURES OF HISTORIC INTEREST



AN UP-TO-DATE CART FOR STREET SWEEPINGS IN 1910
This was given the caption, "A Corner of the Street Cleaning Exhibit," in an article discribing the New York Budget Exhibit of October, 1910, in Volume III of *The American City*

PICK-UP STREET SWEEPER, NEW YORK, INVENTED BY A POLICEMAN
An illustration from an article on "The Disposal of the City's Waste," by William F. Morse, in *The American City* during 1910



DUMPING GARBAGE AT SEA, NEW YORK
This inspiring scene was hopefully described in the Morse article in 1910 as abandoned by the metropolis—a sadly premature claim, despite the statement then that the method defiled beaches 90 miles distant

Progress in Street Cleaning and Snow Removal from 1909 to 1930

By A. M. SOBY

Chief, Bureau of Street Cleaning,
Department of Public Works, Philadelphia, Pa.

WATER-SUPPLY, sewage disposal, street cleaning and the removal of garbage, ashes and rubbish are intimately related branches of municipal housekeeping. Streets must be cleaned and rubbish and garbage destroyed for reasons of sanitation and common decency. The progress in street cleaning has been marked but probably not so rapid as in some of the other branches of municipal activities.

Twenty-one years ago street cleaning was more or less of a slipshod undertaking. Work was done by contract in most cities excepting New York, where Colonel George E. Waring had previously inaugurated his famous "white wings."

The Contract System

Contracts were usually let on a yearly basis, so that the contractors did not improve their plant more than was required by each year's specifications, as they were not sure of receiving the contract the next year. Now, in almost all large cities the work is done by municipal forces, all work being planned by technically trained men.

Early Methods

In 1909 the entire surface of many streets was swept by hand brooming, or portions of the streets were swept wherever there were any accumulations of dirt; this system was called "spotting." On asphalt-paved streets blockmen or white wings did the cleaning. In Philadelphia these men were known as "patent pavement men."

The only machine cleaning was the sprinkler and machine-broom method with hand-broom men sweeping the windrows. The machine brooms smeared the dirt on rainy days or when the sprinklers applied too much water, then when the street became dry, fine dust was blown about by the wind.

Flushers and Squeegees

To overcome the fine dust problem, the pressure flusher and the squeegee machine were introduced. The squeegee was a horse-drawn machine consisting of a tank of water fitted with a sprinkler and a rotary rubber scrubber. They did a very good cleaning job on perfectly paved streets, but were very hard on horses, and as the fins required frequent replenishing, they were very expensive to operate so that after a few years they gradually passed out of existence.

About 1913 the horse-drawn pressure flusher appeared. It was a tightly sealed tank which received its pressure from the fire-hydrant, the incoming water compressing the air in the tank. When the water was first released, it did fairly effective work, but as the tank became empty, the pressure was reduced so that there was only a trickle of water.

The next evolution of the horse-drawn flusher was the separate gasoline motor-driven pump attached to the rear of the tank. This was much more efficient than the compressed-air type.

About 1915 the motor-driven flusher was introduced. It was a much more efficient piece of apparatus than any used previous to that time. The capacity of these early flushers was 1,000 to 1,200 gallons. In the last fifteen years flushers have been greatly improved and the capacity increased, but the size is limited by the weight limits of state highway laws. The average capacity of flushers is now 2,000 gallons, an increase of about 1,000 gallons, which adds greatly to the efficiency of the work.

Flushers are of two types—single- and double-unit. In the single-unit type the flushing pump is driven by a take-off from the transmission; in the double-unit type the flushing pump is driven by a separate gasoline motor. Many flushers are six-wheel single-unit, tractor-trailer type.

Motor-Driven Sweepers and Pick-Up Machines

In many cities motor pick-up machines are now in use. They are motor-driven vehicles with three or four wheels, and are equipped with water tank, gutter broom and rotary broom, and dirt storage box, so that they spray, clean the gutter, sweep the street, and pick up the dirt. Some large cities are using vacuum sweepers.

There are also many motor-driven combination sprinkler and sweeping machines in use without the pick-up attachment.

Street-Dirt Removal Vehicles

In 1909 the most widely used vehicle for removing street dirt was the one-horse cart of 1½ cubic yards capacity. They have been replaced with two-horse wagons of 4 cubic yards capacity, and 5-ton trucks of 6 or more cubic yards capacity.

Catch-Basin Cleaning

Various machines have been introduced for cleaning catch-basins or inlets. In 1909 the only method was to remove dirt from the trap by hand labor. One way of doing this was to use a drag or rake on a long pole, the tines being at right angles to the pole. If the dirt was

compacted, it was first loosened by means of a hook on a long pole known as "harpoon." The dirt was placed on the street paving and then shoveled into a cart or wagon. In some cities a man entered the catch-basin and shoveled the dirt into a bucket which was lowered and raised from the catch-basin by a man on the sidewalk, who emptied the bucket directly into the wagon.

Machines called "eductors" are now used in many cities for cleaning inlets. The eductor is a metal tank mounted on a motor truck which uses a jet for agitating and liquefying the dirt, and a suction pipe from drawing the dirt into the tank. In England they are known as "gully emptiers."

Small clamshell and orange-peel buckets mounted on trucks or tractors are also in use for cleaning catch-basins.

Preventive Street Cleaning

One of the greatest advancements in this field is the introduction of preventive street cleaning. A large percentage of dirt on the street is preventable, and by properly educating the public, much of the avoidable dirt could be eliminated and the streets would be materially cleaner without the use of street-cleaning equipment, thus saving the city considerable money.

Snow Removal

Snow removal has shown wonderful progress in the past twenty-one years. From a haphazard and hasty affair, snow removal has developed into a systematic procedure. Cities now have their organization planned and the work mapped out before the advent of snow. In 1909 practically all snow was removed by means of hand labor and horse-drawn carts and wagons. Now we have mechanical loaders, and clamshell buckets mounted on motor-driven chassis, and all hauling is done by motor trucks or motor-drawn trailer trains. Chemicals for melting snow have also come to the fore in the last few years.

STREET SANITATION OFFICIALS' PROGRAM COMPLETED

WHAT it believes to be the best program it has ever presented, has been prepared by the International Association of Street Sanitation Officials for the 11th Conference at Louisville, Ky., October 9-11. Among the large number of papers, each scheduled to be followed by discussion under leadership, are: "The Effect of Street Cleanliness upon Real Estate Values," by C. Robert Peter, Director, Louisville Real Estate Board; "How to Sell the Public Works Department to Citizens," by Capt. Harrington Place, Engineer, Detroit Bureau of Governmental Research; "Reduction of Organic Waste by Bacteriological Inoculation," by Mark B. Owen, Commission of Public Works, Dearborn, Mich.; "Salvage of Material in Municipal Refuse," by Thomas L. Costigan, Superintendent of Street Cleaning, Washington, D. C.; "Advantage of Bag Containers in Refuse Collection," by Arthur P. Heyer, Director of Public Works, Montclair, N. J.; and "A Sanitary Garbage Collection Ordinance," presented by Carl Schneider, Division of Public Works, Public Property Department, New Orleans, La.

PROGRESS IN STREET-CLEANING METHODS

1. Types of broom men in Philadelphia in 1912. Note the lack of uniforms on the foremen. 2. Machine brooms working in battery preceded by a sprinkler, in 1912. 3. The next advance in street cleaning, 1,500-gallon single unit flushers working in battery. 4. The latest equipment in Philadelphia, 6-wheel tractor-trailer type flushers

Sewers, Sewerage and Sewage Disposal

By GEORGE B. GASCOIGNE
Consulting Sanitary Engineer, Cleveland, Ohio

IT seems almost impossible that very few sewer systems were in use say 50 years ago, and also that the last 20 years have witnessed the important advances and developments that have taken place in municipal sanitation pertaining to the disposal of human and industrial wastes. During the latter period, the concentration of population, together with the findings of sanitary and medical science, have been potent factors in arousing public opinion to the need of adequate sewerage. Then, too, the activities of health, civic and sportsmen's organizations spurred by litigation of private interests, have been determining elements in directing attention to a realization of the necessity of protecting our natural waters against pollution by sewage, the first flush from storms, and industrial wastes. Today we have reached the stage where mentioning the term "sewer" suggests not only the discharge of filthy waste into an underground conduit, but also the disposal of this waste inoffensively.

Comprehensive Plan

The need for sewage treatment has demanded that more care and attention be given the design and construction of sewer systems. To this end notable progress has been made in establishing as fundamental, that a sewer system be laid out in a comprehensive manner to serve conditions estimated to exist some 30 to 60 years in the future. This is a decided advance over the early haphazard sewer installations which were built to serve immediate requirements, and used the nearest convenient outlet.

Sewers and Drains

The advantages and disadvantages underlying the adoption of the separate and the combined systems of sewers, are still debatable. Each type has its place, and each has its adherents. It may be stated, however, that progress is being made in that the conditions favoring the separate system are more appreciated, although it is recognized that it is practically impossible to maintain a separate system without some abuse.

There has been progress in making sewer joints tight, to exclude excessive ground-water infiltration; and in protecting sewers, either by liner plates or by integral or surface protectives where corrosive industrial wastes or other deteriorating compounds are discharged into the sewers. Substantial progress has occurred also in the design of storm drains, which has been brought about principally by the availability of better rainfall records, and the extensive paving of streets. Another forward step is found in the improvements and facilities for pumping sewage. Even relatively small pumping stations can now be installed with reasonable assurance of continuous and efficient operation.

Sewage Treatment

During this 21-year period the most outstanding progress has taken place in sewage treatment. For a few years prior to 1912 there was a period which may be regarded as a testing station stage. Notable experimental stations were operated at Columbus, Philadelphia, Chicago, Cleveland, Worcester and many other places. The accumulated accomplishments of these various experimental stations have been important factors in establishing definite and working data for the design of demonstration plants and large projects. Then, too, the experimental work of recent years has been a large factor in obtaining a better understanding of the treatment processes.

There has been development also in designing sewage treatment plants according to the particular requirements in question. Sewage treatment as now practiced is accomplished by progressive steps, each succeeding step effecting an increase in the degree of purification. Preparatory treatment removes only the coarse floating and suspended material; partial treatment removes most of the settleable solids but leaves the colloids and soluble substances; colloidal treatment goes a step beyond partial treatment but a substantial amount of the soluble solids remains; oxidation treatment changes the offensive dissolved solids to an inoffensive state; while germicidal treatment removes the bacteria remaining after the other steps. Complete treatment includes oxidation and often germicidal treatment. However, it is not always necessary, as one or a combination of two or more of the steps may be sufficient, depending upon the conditions.

The basic principles of sewage treatment have not changed in the past 20 years. The methods used, however, have changed perceptibly. Chemical precipitation, septic tanks and contact beds, standbys of former days, are no longer used except in special instances. On the other hand, this period has seen the Imhoff tank introduced and still in popular use. The accomplishments of fine screens and their adaptability have been established. The activated sludge process has emerged from the toy of 1915 to a full-fledged industry in the large plant at Milwaukee. The feasibility of disposing of activated sludge by digestion will have great influence in making this method more attractive. The trickling filter has been improved until now it is recognized as a standard and reliable method for oxidation treatment.

The disposal of sludge by digestion has progressed from the uncertainties of the septic tank to well controlled heated units of the separate digestion type. The drying of sludge on open beds, while still commonly practiced, is rapidly giving way to the covering of the beds with greenhouse glass, thus making the beds independent of weather conditions and available for all-year-around use. Various mechanical equipment for the continuous removal of sludge has risen to general use and popular favor, and altogether there has been the development of refinements in the various details of sewage treatment, all directed towards making the processes more effective and positive in their operation. This statement applies to practically every treatment device now known, from the bar grating to disinfecting apparatus.

Operation

Perhaps one of the most outstanding evidences of progress is the changed attitude towards operation. As with design, methods of operation which may control have made substantial progress. It now seems that civic opinion actually demands that a sewage plant be given proper operation. Legislative acts have made possible more certain financing in this respect, and state and municipal agencies are active in developing capable operators.

During the 21-year period sewage treatment has developed to the extent that today, with proper operation, it is possible to treat sewage continuously by several well-tried processes, to any desired degree of purification, and without offense.

The Movement for Low-Cost Housing

By HONORABLE ALFRED E. SMITH
President, Housing Association of the City of New York

FROM the time that I first gave consideration to the housing program and what might be accomplished in solving it, it became apparent to me that what we needed was not more laws or more talk, but new housing of the right kind. We have in New York a fast-growing city putting itself together without plans and rarely stopping to see where it is going. It seems that the larger the city, the more difficult it is to make definite advances. Economic conditions in New York are such that we found out early in the game that the building of new houses on high-cost land to rent at low rentals was unprofitable. It becomes increasingly clear that if we are to have new housing or propose even the rehabilitation of housing in a big city like New York, there must be a sacrifice made somewhere either in the way of subsidy, by direct or indirect methods or by personal sacrifice of profits. As a matter of fact, the two things must go together in some sections where land costs are high.

Experimental Undertakings in New York City

The State Housing Law in New York makes provisions for thrift charges to be extended to limited dividend companies that engage in housing projects and undertake to keep within a prescribed rental. These thrift charges are in the form of tax exemption and only just about sufficient to carry the project over. Even then, housing projects within the limit of the boroughs of Manhattan, Brooklyn, Bronx or Queens must be undertaken on a large scale of units, a block square at least, in order to assure the actual return of six per cent on the money. Just recently the first undertaking of this type on plots 100 by 100 has been sanctioned by the State Housing Board. It is entirely experimental and is on a non-philanthropic basis.

Such undertakings as we have in the metropolitan area of New York City house together less than 5,000 families. Neighborhoods cannot be certain whether the construction of tenement houses in industrial centers spread out through all the boroughs of Greater New York are workable, or whether only the outlying boroughs can be adapted for low-cost housing. Nor is there a certainty as to just what forms the state control can take, or should take. An adequate housing program must be able to consider experimenting with new forms of construction and also study and further the possibility of rehabilitation of used buildings in older forms of tenement house connstruction.

The Housing Association of the City of New York, recently formed, proposes to give a hearing to all theories and to bring together various improvements looking toward the adequate supply of low-cost housing. With the increase in building and land costs, it is not easy to work out such projects for Manhattan Island, but several theories are under way. The beginning, the rehabilitation of the lower East Side, has been started by Lieutenant-Governor Lehman and Commissioner Aaron Rabinowitz of the State Housing Board on the old Hoe property, a square block in the heart of the "slum" district.

The Sort of Cooperation That Is Needed

The great difficulty which we have always had to face in housing construction is obtaining low-cost money. I attempted to solve that when Governor. I suggested a state housing bank which would loan money at very low rates of interest for limited-dividend housing undertakings. This was considered by the State Legislature and rejected, although the Legislature provided forms of credit subsidy such as tax exemption. It must be somebody's business to watch housing from the social and not purely regulatory phase. Communities, especially, should be concerned with it, since it affects living conditions of children. Proper sanitation can be worked out by local organizations. Provision of a reasonable active supply of good housing for a great mass of low-income families has not and cannot be solved by legislation. There must be financial, social and business cooperation to understand and push forward the program, and this is the purpose of the Housing Association of the City of New York, of which I have the honor to be President. I heartily recommend the plan to other communities.

Planning the City and the Region— Then and Now

By HENRY V. HUBBARD

Chairman, The School of City Planning, Harvard University

THE birth of THE AMERICAN CITY, twenty-one years ago, was a sign that, for the first time, our cities were generally coming to believe that their growth, though inevitable, did not have to be blind; that they would grow better by taking thought, and that the experience of one would be valuable to others.

The City Beautiful

When this idea was new, it seemed to be applied only to the outside of our cities, and appearance, especially that striking appearance which comes from designed arrangement, was the inspiration of all our efforts. The World's Fair at Chicago in 1893 had already given an American example of monumental ordered beauty to those who could not see the examples of Europe; and Charles Mulford Robinson's books had applied the essential principle to smaller and less expensive things. In 1909 the Burnham plan for Chicago set up a noble ideal of the form of a city, which has indeed since proved to be to a large extent as practical as it was inspiring.

But many of us missed the point that beauty in a city must be a flowering of practicality, in scale with the pocketbook as well as with the genius and the ambition of the community, and the failure of many superficial and overweening plans soon made "The City Beautiful" almost a term of reproach.

The City Unified

Even from the beginning, however, one of the most fundamentally practical and human problems of city planning was appreciated and attacked. In 1909 was called at Washington the first National Conference on City Planning and the Problems of Congestion. The same title was used for the Conference in 1910. Thereafter the present title was used—National Conference on City Planning. The soundness of the attitude of the first founders of the Conference is now very evident. We know that dispersion is a principle of design and economics as much as is concentration, and that open areas and spaciousness are essentials just as truly as are buildings and mass transportation.

In 1911 was the first conference of the National Housing Association. In 1913 appeared the report of the Heights of Buildings Commission of the city of New York, the real launching of the idea of comprehensive zoning. The esthetic side was not entirely lost sight of, however, as witness the appointing of the National Commission of Fine Arts in 1910. By 1916 a number of books had appeared, giving a comprehensive statement of what city planning is—most notable, perhaps, being "The Planning of the Modern City," by Nelson P. Lewis.

Professional Practice and Cooperation

In 1917 the American City Planning Institute was organized, marking the fact that there was desire enough for skilled comprehensive advice in city planning to make the giving of such advice an established profession. With the war came the experience of cooperation of experts in cantonment design and in housing, which brought strongly to our attention both the mutual interdependence of the various contributing professions, and the essential unity of the whole problem of community design. The establishment in the United States Department of Commerce of a Division of Building and Housing, with an Advisory Committee on Zoning, subsequently on City Planning and Zoning, gave the highest official recognition to city planning as a money-saving business proposition.

A Social Responsibility

Now we have come to a fairly general recognition of city planning as a great social movement, rooted in the need and duty of the community to make possible of attainment for its citizens the necessities of a full and efficient life. This conception motived the recognition by the Supreme Court of the United States of the legality of zoning based on comprehensive city planning. We have the idea. There is still far to go before our cities shall be manifestations of this idea, in inward efficiency and in outward order and beauty, but even a casual review of the immediate past warrants high hopes for the future.

Regional Planning

It was not long, in the progress of city planning, before it became evident that the community of interests which had to be planned as one was not always contained within one political boundary. A metropolitan water board, a sewerage board, and a park commission had come into existence in Boston, as the only practical answer to an unescapable problem. In 1919 these were amalgamated into the Boston Metropolitan District Commission. In 1925 the Niagara Frontier Planning Board, in 1926 the National Capital Park and Planning Commission, and, starting earlier with Los Angeles and Milwaukee, a considerable number of county planning commissions, all showed the inevitable tendency toward regional planning.

The tremendous difficulty of unified planning by different and usually competitive and jealous political entities has caused the formation of unofficial bodies which

hope to make regional plans that will be so obviously a benefit to all concerned that the logic of circumstances will force their acceptance, if not wholly, at least enough to make the effort and sacrifice worth while, not only for its benefit to the region planned but for the general guidance and inspiration of other regions with similar problems.

The Regional Plan of New York, sponsored by the Sage Foundation, was launched in 1922. In 1929 the plan was publicly presented to the citizens of a region of 5,528 square miles. The Chicago Regional Planning Association was organized in 1923, and established in 1925 as a non-profit-making corporation, planning for an area of 7,800 square miles. The Regional Planning Federation of the Philadelphia Tri-State District was organized in 1925, inspiring and informing unified action for an area of 3,500 square miles.

Wide Cooperation and Local Independence

Obviously, we have not reached the end of the idea that planning for common benefits should not stop at minor political boundaries, nor even at major political boundaries, for that matter. State planning, national planning, even world planning, are by no means empty words. But neighborhood pride, local self-government, and the individuality of small communities are also sound and basic ideals not to be overthrown. The successful big plans of the future will therefore tend to be the result of the voluntary agreements of many communities, brought together by common beliefs and mutual respect, or at least by the recognition of a common necessity.

Research

City planning is planning for the future, but it can be based only on a knowledge of the past. This knowledge does not automatically codify itself. Nor can the city planner, faced with an immediate concrete case and an insufficient appropriation, be expected to compile it all. Research, then, is essential, subsidized to give it power and time. Its results will be twofold. First there will be the compiling of existing city planning experience in shape for comparison and ready use. Then there will be the working-out of new theories and the collection of further specific facts not before anywhere assembled, to test these theories in the light of actuality.

Teaching

City planning is now a science, or at least a scientific endeavor. It must be taught, for the coming practitioner cannot afford to learn only in the school of hit-or-miss experience. City planning instruction has been given in increasing fullness for many years at Harvard, and the collections of the City Planning Library there have long been a national center of bibliographical information. Last year there was founded at Harvard an independent graduate professional School of City Planning for teaching and research. Others will doubtless follow, as need arises. But there will never be a very large body of practitioners concerned with city planning alone. Rather will most city planning be done by the mutually respecting cooperation of engineers, landscape architects, architects, lawyers, economists, realtors, and many others, all "community-minded," and each contributing what he is specifically trained to give. This should be recognized by any school which essays to teach in the field of city planning.

Publicity

But back of the practitioner, back of any individual, must be the conviction of the community that city planning is something worth having, and worth paying for, in money and in some sacrifice of individual gain. Without this general conviction, city planning is an alien and sporadic ideal. To further this popular education, to give a forum where practical men may exchange experiences, to mold and inspire public desire for the good things in city planning, has been the task of the National Conference on City Planning. A magazine was published by the conference from 1915 to 1918, called *The City Plan*. In 1925 the more ambitious quarterly, *City Planning*, was brought out under the same auspices, which has become an established medium of authoritative information.

The publication, however, which has brought city planning home to the people generally, and has given specific city planning information to the municipal officials who directly use it, has been the magazine which now celebrates its twenty-first year of ever expanding usefulness. No better wish could be made for city planning than that the editors of THE AMERICAN CITY may continue their devoted labors, and see the increasing effect of them, for the next twenty-one years.

"THE INDISPENSABLENESS OF CITY PLANNING"

REMARKABLY pertinent to conditions existing generally today is the plea made by the late Charles W. Eliot, LL.D., M.D., then President Emeritus of Harvard University, in an article of the above title appearing in Volume I, Number 1 of THE AMERICAN CITY, excerpts from which follow:

"Good planning for cities and closely-built towns and villages is not primarily a matter of esthetics, but of economics. The main object is to prevent or remedy the physical and moral evils and losses which accompany congestion of population. To effect this object it is necessary to prevent the corruption of the air the people breathe night and day, of the water they drink, and of the foods they eat; and to this end well-ventilated dwellings, shops, and factories, a pure and abundant water-supply and a safe sewage disposal, and rapid transportation and prompt delivery for foods, are all indispensable. There must also be provided rapid transportation for passengers and all sorts of goods into and out of the city, else the population will not be spread over a sufficient area, and the industries which support the people will not be carried on advantageously.

"To secure these benefits and safeguards is the purpose of wise city planning. A good plan will provide convenient, well paved, and airy highways, frequent open spaces both large and small, well placed with adequate terminals, radial avenues, and circumferential boulevards, and will also take thought for the water-supply, the sewers, and the telegraph and telephone services.

"The laying-out of most American cities has been casual, and thoughtless of future needs. The common rectangular layout, without any well-considered diagonals, causes a great daily waste of human and animal labor and fuel; while high buildings, narrow streets, and lack of open spaces make it impossible to keep the cities well aired and well sunned. To improve or reform the layout of most American cities is therefore a great public need, not only for beauty's sake, but for the sake of the health, efficiency, and happiness of their people. . . . .

"It appears, then, that reform in the laying-out of American cities must, in general, wait for the coming of two other great reforms, first, for municipal reform, and secondly for the reform of the existing methods of local taxation."

Zoning, Too, Has Come of Age

By **EDWARD M. BASSETT**
Past President, National Conference on City Planning

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IN 1909, twenty-one years ago, occurred the first glimmerings of zoning in this country. The Massachusetts Legislature had previously divided Boston into two districts, in one of which buildings were limited to a height of 125 feet and in the other to 80 feet. On May 17, 1909, the United States Supreme Court in the now famous case of *Welch v. Swasey*, declared that this was lawful. In the year 1909 Los Angeles under a home rule charter divided itself into residential and industrial districts. Under this ordinance the city ousted a brickyard from a residence district and was upheld in so doing by the United States Supreme Court in the case of Hadacheck. No one sensed the fact that these decisions betokened a new science—not any more than that the flying of Wright brothers at Kitty Hawk betokened the birth of the science of aviation.

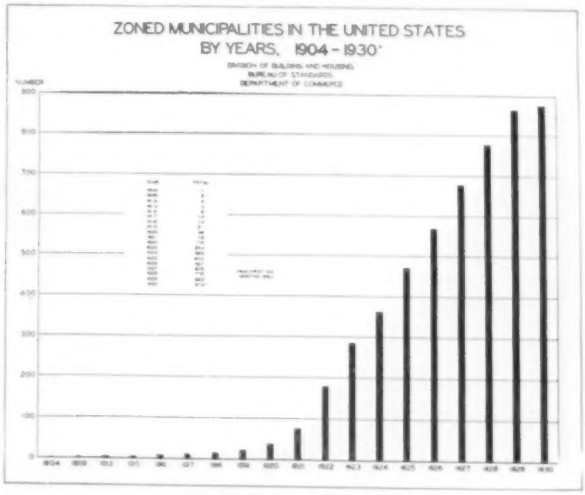
The Chaotic Conditions in 1913

At the Chicago meeting of the National Conference on City Planning in 1913 the roll of cities represented was called to learn what ones had a height limit. Only a few cities responded. New York was not among the number. This was the first inquiry ever made by the Conference on the subject of height regulation. I remember that we talked only of a single height limit for a city. We gave no thought to different limits for different parts of a city.

Modern zoning was then undreamed of, and the prophecy implanted in the Welch and Hadacheck cases made little impression. Cities were at the mercy of exploiting builders. Office buildings could go to any height and cover 100 per cent of the lot. Tenement houses could invade one-family detached home districts. Factories and garages could be built anywhere in business and residential streets. The small retail store would seek a residential corner, hoping to short-circuit the trade of the neighborhood. Business streets often were depressed because stores could so easily move into the residences. Chaotic conditions became unbearable in every great city. Private restrictions were the only recourse, and these were not usually employed to protect apartment, business or light industry districts. They often expired in fifteen or twenty years.

Our First Comprehensive Zoning Plan

In 1913 Greater New York, after five years of preparatory work, let the contracts for the dual rapid-transit system. This was designed to distribute the population and relieve congestion. Five men, of whom George McAneny, then President of the Borough of Manhattan,



HOW THE MOVEMENT GREW

In 1916, when New York's comprehensive zoning ordinance was adopted, there were, as above shown, only eight cities in the United States having any form of zoning control. By 1920 the number of zoned municipalities had increased to 38; by 1925, to 470; and at the end of the first six months of 1930, it was 874

was the leader, started the idea that building regulations might be invented that would supplement the purposes of the great rapid-transit plan by helping to distribute the population. In July, 1913, Mr. McAneny secured the appointment of a Heights of Buildings Commission, and one year later of a Commission on Building Districts and Restrictions. These two city commissions during a period of three years developed the first comprehensive zoning plan of this country. It went into effect July 25, 1916, and remains today substantially the same as when passed.

Most lawyers and many prominent judges declared during the period of the preparation of the New York zoning ordinance that the courts would not uphold such an invasion of private property rights. Many property owners considered the whole effort to be merely a passing fancy, while others favored any legislation that would make a talking point for the sale of land and buildings during the slack period of war time. The situation was so precarious that the Zoning Committee was organized to keep the new law from the scrap-heap and to make the idea of comprehensive zoning known to other cities. It was feared that, if Greater New York was the only city to make this intimate use of the police power, the courts might annul zoning because it was not widely adopted. St. Louis, Newark and Yonkers were among the early cities to adopt zoning. But all was not smooth sailing, for zoning received severe court setbacks in Missouri, New Jersey, Illinois and Georgia. At one time it looked as if every state along the Atlantic from New Jersey to Alabama would declare against zoning.

The Court of Appeals of New York in the Lincoln Trust Co. case in 1920 upheld the zoning plan of the city, saying that the regulations so far as reasonable would be held by the courts to be within the scope of the police power. It is hard to realize today what relief and courage this decision brought to those who for seven years had worked to establish police power zoning.

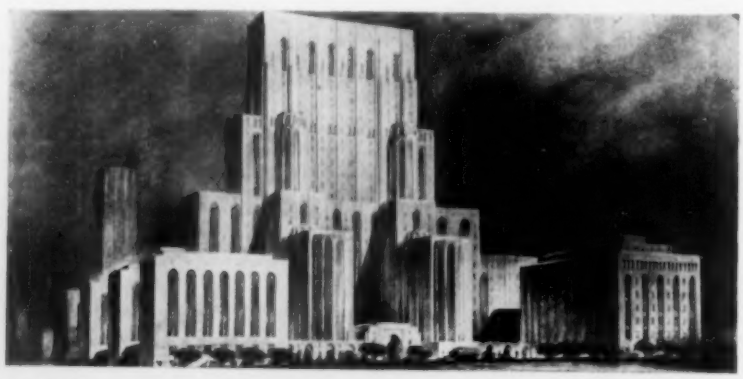
Police Power—Not Eminent Domain

Many critics throughout this period had insisted that the plan must be based on eminent domain; that the rules of height, bulk and use were more than lawful regulation and constituted a taking for a public purpose. They said rightly that private property could not be taken for a public use except by making payment. If they were right in assuming zoning to involve such a taking there could be no zoning under our federal and state constitutions, for all admitted that the intricate and expensive processes of eminent domain could not operate successfully regarding all land and all buildings in a great city. Moreover, it was seen that eminent domain would impose permanent ossification. It was seen that, although the regulations must be stiff, they must be susceptible of quick and inexpensive change in order to adapt themselves to the growth and change of the city. This adaptability could be secured only by employing the police power. In preparing the zoning plan the regulations were therefore based on the health, safety, morals and general welfare of the community.

Zoning Now Is a Matter of Course

After the Lincoln Trust decision, zoning began to spread even more rapidly than before, especially in the Middle West. The Department of Commerce under Secretary Hoover put out the standard zoning enabling act, which helped amazingly. But the hostile states became even more hostile. Then in 1926 came the great decision of the United States Supreme Court in the Euclid case, upholding comprehensive zoning all along the line. State after state reversed its position. New Jersey put itself in line by passing a constitutional amendment for zoning. Practically all the states adopted enabling acts. The last report of the Department of Commerce gives 874 zoned municipalities in the United States. Zoning has become almost as much a matter of course as a fire department or a public school system. The constitutionality of zoning is no longer questioned anywhere. Singularly enough it has become of age within the identical life span of THE AMERICAN CITY.

EDITORIAL NOTE.—Due to the exigencies of space and to the large number of special anniversary articles appearing in this issue, the regular monthly department of Zoning and Planning Notes which has been conducted by Frank B. Williams since June, 1923, is omitted. It will be resumed next month.



THE EFFECT OF ZONING ON ARCHITECTURAL DESIGN

The pioneer New York zoning law, with its now historic "set back" requirements was drafted by a group of technical experts who based its provisions upon the practical necessities of public safety, health and welfare, as arising after the use of steel construction had made apparent that the sky is the limit in building heights. The influence of the "set back" on building *design* was almost if not wholly unpremeditated: its effect was immediate and epochal and has already resulted in "the new American architecture," examples of which rise skyward in cities all over the country. The above illustrations show a fine example of modern hospital design,—the new New York Hospital group, the cornerstone of which was laid on June 12, 1930; and in contrast, the present building of the Hospital, which was completed in 1877. The Boston firm, Coolidge, Shepley, Bulfinch and Abbott, are the architects of the new Hospital

Municipal Park Systems—Their Growth and Value: 1909-1930

By CLARENCE L. BROCK

President, American Institute of Park Executives; Superintendent of Parks, Houston, Texas

MOST of the development of parks as a municipal activity has taken place within the last twenty-one years. This is particularly true in the South and Southwest, but, whereas for the country as a whole in 1909 there were few cities and towns with more than a public square, even the smallest municipalities today are beginning to recognize that one of their responsibilities to their citizens is the provision of adequate recreation areas for the whole population.

Parks Pay in Actual City Cash

Parks are no longer thought of as a luxury, but as a necessity to the happiness and well-being of the community. Moreover, parks are today being recognized as an investment that yields big financial returns to the city providing them and to the owners of surrounding property. This is a point which has been stressed by all recent authorities writing on the subject. Among the most recent of these are Theodore Kimball Hubbard and Henry V. Hubbard, who include in "Our Cities Today and Tomorrow"* a special report on "Effects of Public Open Spaces on Land Values," showing, for instance, that authorities of Grand Rapids, Mich., report an increase of 100 per cent in valuation of property due to its proximity to Wilcox Park, and that land around the 2,000-acre Belle Mead Park in Nashville, Tenn., is reported to have quadrupled in value during the first twelve months following the park acquisition. Increase in valuation of surrounding property brings an increase in taxes that eventually pays for such part of the park investment as cannot be assessed against the property immediately benefited. During the last few years there have been several notable examples of city and regional open areas that have been paid for many times over in this manner.

The Park System Should Be Part of the City Plan

In present-day city planning, provision for adequate spaces for present and future recreation requirements is made secondary only to the one matter of the street and highway plan. The penalties now being paid in many places by past planless and haphazard development are constant reminders that the ever-increasing need for public park land in city and town must be met by purchase in advance of now fairly predicable city growth, or the cost becomes prohibitive. In my own city, Houston, more than 1,750 acres of recreation land have been acquired by purchase or gift since 1924, in addition to the 800 acres previously held. Several miles of bayou land has been similarly acquired to be used as connecting parkways. This is all furtherance of the municipal park system, which is a part of the comprehensive city plan.

In the development of such a park system, accepted practice now dictates for every city of considerable size a large acreage including woodland, picnic spaces, and provisions for a great variety of active and passive recreation, readily accessible to the population as a whole. In addition there should be neighborhood parks within a half-mile of every home; there should be athletic fields with sufficient acreage for baseball, football, track meets, tennis, and all active sports; a few downtown squares or rest parks.*

Space Standards for Parks

Various efforts have been made to establish space standards for such areas. One acre of recreation land for each 100 inhabitants has been called the ideal standard, but one acre for every 200 to 500 is a more realizable standard, with one acre allotted to active recreation uses for every 1,000 inhabitants, and one neighborhood or local park for every 1,000 to 5,000 inhabitants. According to a recent report of Charles H. Cheney, Chairman of the Committee on City and Regional Planning of the American Institute of Architects:

"Both small and large cities increasingly seem to appreciate provision of playgrounds for both children and adults with the centralization of children's playgrounds at schools. More cities are adopting the 10-25-40 standard; that is, ten acres for each elementary school, playground and park, about a mile apart in metropolitan areas; twenty-five acres for junior high school and playfields about every two miles; and forty acres for senior high schools and junior colleges three miles apart."

However, such figures cannot be applied everywhere, since locality, density and character of population, accessibility to open country or large state or county parks, and private open spaces required under zoning regulations all have a definite bearing upon the requirements of the particular case.

Transforming Blighted Areas into Parks

The value of parks to a community is now so thoroughly recognized that citizens in many places are giving land, and money for land, to be used for park purposes. There are, or should be, provisions in every city charter whereby

* See page 172 of the December, 1929, issue of THE AMERICAN CITY.

* More detailed provisions for playgrounds and swimming pools are not discussed here, since these are the subjects of special articles. See pages 105 and 123.

such land, once dedicated for park use, cannot be appropriated to other purposes.

Up to a few years ago, areas lying along streams were considered of little value except for use as city dumps or factory sites. Today these stream banks, often representing the most beautiful scenery of the entire locality, are being publicly acquired for conversion into parkways. Progress made along this line in various parts of the country has operated and is operating to transform great areas of waste land or blighted sections into scenes of almost spectacular attractiveness. Herein lies one of the most outstanding features of the whole 21 years of park development history since 1909.

That such development is becoming a matter of national acceptance, not only by park authorities but by highway and traffic engineers, is evidenced by the report of the Committee on "Measures for the Relief of Traffic Congestion" of the National Conference on Street and Highway Safety presented in Washington in May, 1930, which states that "in the development of arterial highways, consideration should be given to the possibility of the parkway or freeway type of development, with no right of access from immediately abutting property, thus facilitating safe and speedy travel on the highway and high-grade development of the adjacent land."

HOUSTON, TEXAS, IS PROUD OF HER PARKS

Above are three typical views in this well-conceived system. They show (top) the bridge-pond and flight-cage at the Hermann Park zoo; below it, the Hermann Park entrance, designed by the late George E. Kessler; and at the bottom, a typically landscaped bridge in Cleveland Park

Street Trees—Zoos—Golf Courses

With the coming of everyman's automobile and the ever-growing need for more boulevards and speedways, the problem of street trees becomes acute. In development of new sections in some places, the planting strip is being placed inside the sidewalk pavement and adjacent to the property line. In other places, under zoning regulations, private property building lines are being established farther from the street line, a practice which incidentally permits publicly planted street trees to be placed upon private property, leaving the entire street width for traffic.

One feature of park development in which remarkable progress has been made recently is the zoo. Even smaller cities in many parts of the country now maintain creditable zoos. A zoo with proper ground arrangement and naturalistic surroundings for the animals multiplies the effectiveness of a park area and outstrips every other feature attraction in its drawing power not alone for children but for the citizens as a whole, and for visitors.

The public golf course is another feature in the provision of which outstanding progress has been made. There are 271 municipal golf courses now in operation, according to 1930 figures of the Public Links Section of the United States Golf Association. These are almost all under park department control. Many of these are, of course, in public parks. Most of them are as well equipped as courses belonging to private clubs and are self-supporting from the revenues derived from fees.

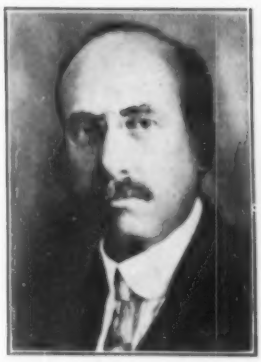
Many cities have outdoor theaters and stadiums which are continuously used for plays, band concerts and motion pictures. Many cities are now building municipal airports, which in some cases are considered a part of the park system and are landscaped and beautified to fit in with the other features. Builders of new subdivisions are so thoroughly recognizing the value of parks that very few new residential developments are now planned without at least one park being included.

In the matters of administration and finance, experience has taught in most cities that the greatest progress is made under a board of park commissioners and with a special tax for park development and maintenance. A park system is a matter of planning over a period of years. It is most advisedly correlated with other "long-time program" improvements in the city plan. This fact makes a definitely established revenue essential.

There is no branch of municipal activity where study and research is more active than in the park department. Park executives have organizations covering every branch of park service, which includes general supervision, recreation, zoological gardens and aquariums, as well as taking an interest in national, state and county park development. These executives meet regularly for the discussion of the problems connected with the park department, and much of the progress made in park development is the outcome of these conferences.

Random Thoughts on Twenty-One Years of Recreation Progress

By HOWARD S. BRAUCHER
Secretary, National Recreation Association



WHEN the first issue of THE AMERICAN CITY appeared, in 1909, playgrounds for children in theory were well established. Only 267 cities had put their theories into practice, but Joseph Lee, Jacob Riis, William Kent, Jane Addams, Luther Halsey Gulick and many others had all helped men to see the necessity of giving city children places to play under leadership. The Chicago South Parks had already challenged nation-wide attention as to the possibility of making playing fields with field houses centers of neighborhood life and influence. It is true that many playgrounds were open only during the summer months; new leaders, often without much training, were employed each year, and many of these playgrounds were carried on by women's clubs and by private groups. Solid foundations, however, had been laid on which an enduring structure could be built.

From early days American towns and villages had kept their "commons." The value of public parks as beauty-spots through which one could walk and ride horseback and drive one's carriage had been recognized. Hull House and many other settlements, though not founded as recreation centers, had already demonstrated what resourceful leadership could do in making life more zestful. Physical education in the schools had recognized the importance of giving attention to the body and, though formal gymnastics had great emphasis, in New York City the Public School Athletic League was already organized and games were beginning to have a larger part in physical education. College athletics, college glee clubs, college life with its celebrations and good times, were sending many back into the communities with a desire to see more of vital living.

Then progressive education was already beginning to be heard. John Dewey had spoken and written. George E. Johnson had conducted the Andover Play School in 1898. Hundreds of persons in our colleges had obtained almost a new religion as they painfully dug out of Froebel's writings his revelations as to the possibility of helping each child, each person, to develop his own particular gift, assisting each individual to be a new creator of what had never existed in just this form before.

Many Streams United

Important as were the children's sand gardens developed in Boston in 1885, 1886, and placed under paid leadership in 1887, many other streams united to make possible the modern recreation movement in America.

Educators, kindergartners, workers in the slums, charity workers, civic workers, park leaders, Y. M. C. A. workers, physical education workers, public-spirited citizens and plain fathers and mothers united when the Playground Association of America was established in 1906. Later the name was changed to Playground and Recreation Association of America, and, finally, in 1930, to National Recreation Association.

Growth

Parents watching their children at play on public playgrounds soon wished to play themselves. The swimming pool was refreshing for the boys and girls—why not for the fathers and mothers and the older brothers and sisters? Boys growing up on the playground did not want to give up baseball and basket-ball and soccer when they went to work, and so there came to be public provision for recreation for industrial workers and all workers.

In the early recreation programs there was some evidence of nearly every activity that has developed on a much larger scale later, yet it has not been without a quiet struggle that public recreation has grown until it includes: choral societies, glee clubs, orchestras and bands; dramatic clubs; nature activities, gardening, nature trails, hiking, camping; handcraft, making toys, kites, push-mobiles, boats, and, since Lindbergh, miniature aircraft; art work, clay modeling, brass work; reading clubs, debating clubs, discussion groups. That is, recreation is no longer physical only, but is as varied as are the interests of the human spirit.

Much less was done in the early days to try to establish recreation habits which would reach back into the home. There was less thought of church recreation for the church's own membership. Less attention was given to the recreation of natural groups which are getting together and which want something they can do together.

Movement Rather Than Institution

There has never, however, been an attempt in the national recreation movement to build an institution which should be in competition with other groups, but the aim has been to provide places and leadership which should be used by all groups, and to create recreation habits which should help all groups in which men and women unite.

The movement has been and is primarily educational, in that it has worked to give all children and adults skills, habits and attitudes which make for joyous, vital, worthwhile living in all relationships—home, church, school,

club, neighborhood. The playground, the athletic field, the swimming pool, the community center building, are only a means of giving such recreational training as fits persons now and in the future for victorious living. Of course, this means trying to help the citizens in each city and town to have a trained recreation person in charge who thinks constantly in terms of "What do the children and the young people and all the people need in the way of places for recreation and leadership? How can each person have that form of recreation which will mean most to him?"

This need for leadership has meant the establishment of a graduate National Recreation School for training such leaders, which graduated its first class in June, 1927. It has also meant the building-up of a recreation literature.

Land Planning for the Future

The attitude of real estate subdividers has completely changed in the last twenty-one years. Now subdividers recognize that it is actually good business to set aside land for parks and playgrounds at the same time that the streets are laid out; that ordinarily the lots under such a plan sell with less effort and that the cost of the open space can be added to the selling price of the original lots without protest from the buyers. This change in public thought was greatly influenced by the thinking and writing of William E. Harmon and by his own personal work on this problem.

City planners are, of course, a great source of strength for recreation planning, and the development of the city planning movement each year means much for recreation. City planners now take it for granted that adequate recreation is essential.

Rural Recreation

In the beginning the recreation movement was thought of more as a space movement. Space must be set aside in the crowded, congested cities. It is significant that during the last three years nowhere has the response to recreation been heartier and deeper than in the work done in cooperation with the United States Department of Agriculture in training the men and women now in positions of leadership in the rural districts so that they lead also in recreation, in music, drama, games.

Recognition of Recreation

Under recreation commissions, park boards, school boards and other special groups it is estimated that not less than $200,000,000 a year is now spent for recreation in its wider aspects.

Within the twenty-one years since 1909 the idea of municipal support of recreation through tax funds has been firmly established. Recreation is taking its place side by side with education as one of the major enduring functions of government.

The New Basis of Public Demand for Recreation Training

During the last twenty-one years America and Europe have come to recognize that leisure time for the masses of people is rapidly increasing; that in general we are now producing more goods than we can consume; that there is a limit to which modern advertising can be used to increase the consumption of goods; that it is not desirable over long periods of time for persons to be buying on the installment plan, going heavily into debt to purchase more things; that if there is a limit to the consumption of goods, if we wish to avoid unemployment for million of workers, the only hope lies in a still further reduction of the number of hours in the working week.

This reduction of the number of working hours is based on present production per man and present inventions. Now there is no question in the mind of thoughtful persons that inventions are increasing; that machinery is to do still more of man's work; that production per man will soon be much greater than at present, while there is a distinct limit to the extent to which man can be induced to consume more food, wear out more clothing, buy and use more things. So the problem of dividing up the work of the world so that each person may have a chance to work, is soon to be a much greater world problem than it is today. And the only solution is that each person shall have greater leisure. The problem of giving the individual the facilities he needs, the chances to get together with his fellows in the way he desires and to do the things that give him the best and most permanent satisfactions—in all this, leisure is one of the major new problems of this civilization in which we live.

The evidence seems to point to man's getting the most enduring satisfaction when he himself does something rather than when someone else does something for him. For most people there is more fun, in the long run, in sailing a boat than paying someone else to sail it for them; more fun in swimming than in watching someone else swim; more life in trying to learn to sing and play the piano than in paying someone else to sing for them and play for them. Man is so constituted that the purchase of things beyond a certain point does not give the same pleasure that he has in being skillful in doing something himself. And most persons have special capacities for skills in certain directions. The special task of recreation is to help each person to try himself out along enough different lines to see if he can develop the skills that will give him real satisfaction. He may be an amateur and lesser Babe Ruth, Kreisler, Minnie Maddern Fiske, Helen Wills Moody, Lorado Taft, but time will never hang heavy on his hands. If we wish to keep people from seeking adventure in non-social ways, we must expose them to delightful ways of using time which are not anti-social.

At the present moment it is the realization of the pressing immediate nature of this leisure-time problem that has led President Hoover to announce the calling of a White House Recreation Conference; that is causing college presidents, industrial leaders, chambers of commerce leaders and moral and religious leaders to think so seriously of recreation.

It is true there were occasional references to leisure time back in 1909—for that matter, as Dr. John H. Finley and others have pointed out, so long ago as the time of Aristotle. But such references were then more or less academic and philosophical, and now one can hardly pick up a magazine without seeing some reference to the immediacy of this problem of leisure.

In 1909 or thereabouts I used to call upon a young man, who has since become a leading international banker, and talk with him about recreation. "You must show me," he would say, "that recreation will produce more goods; that recreation will help to grow more corn." What might be the ultimate purpose of producing more

corn I never could find out. "The wealth of the world must be increased," he thought, and he wanted evidence, testimony, that manufacturers found their production on a surer basis with adequate recreation for their workers and their families. Such evidence was obtained and submitted.

But now a new generation has arisen. Recreation no longer has to justify itself solely in terms of more and better work. "My father worked all the time and he tried to get me to work all the time. I said to him: You are a long time dead. I am going to live a little as I go along." This is a quotation from a college graduate a few years out, and it represents the new public opinion that now supports municipal golf courses, tennis courts, roque courts, bowling greens, swimming pools, community recreation centers in public schools and elsewhere; that establishes county picnic parks, state parks, national parks; that makes possible the spending of a million or more dollars a year in cities like Detroit and Los Angeles from tax funds for recreation purposes.

Of course we must have business and manufacture and agriculture as a foundation on which to build modern living, and we must have recreation to help keep business and commerce successful, but a public opinion has grown up which no longer recognizes business as the supreme reason for existence. Music, drama, art, handcraft, athletics, collecting, recreation in all its forms, are a part of life and their own reason for being. They enable man to be himself and that is enough.

The World War's Influence on Recreation

During the World War recreation as a means of keeping men clean and fit, under the leadership of Secretary of War Newton D. Baker and Raymond B. Fosdick, had a real demonstration. Though the war apparently, on the whole, interrupted and set back the normal growth of recreation in America, it did give such a demonstration of recreation that the American Legion posts of the country have been ready to stand solidly behind the recreation movement, and it did help to create a new public opinion toward recreation. Recreation was more accepted as a matter of course, even though there was a slowing-up of funds for all altruistic purposes following the war.

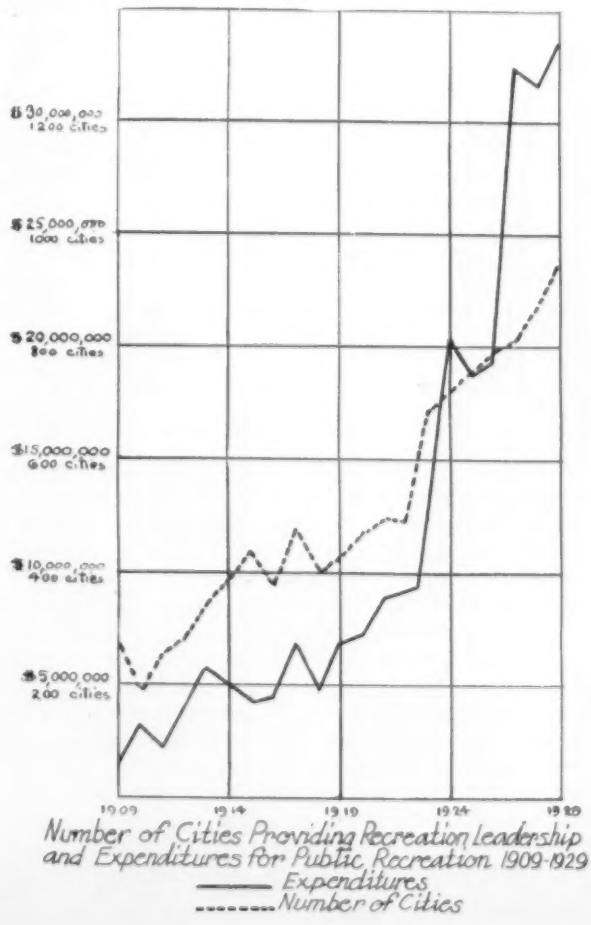
No small part of the work done in keeping recreation conditions in the cities near the United States camps as nearly ideal as possible for the soldiers and sailors and marines during the war period was due to the able leadership, the courage, statesmanship, steady faith and hard work of Harold S. Buttenheim of THE AMERICAN CITY in carrying through the first campaign for funds. The magazine has always stood behind the same steady development of recreation in America, and many times during the last twenty-one years we have traced support for wise community recreation programs back to the leadership which has prevailed in THE AMERICAN CITY.

The Story of Recreation Growth in Figures

UNDER the caption, "Progress in Public Recreation: 1909-1929," The Playground and Recreation Association of America, since become The National Recreation Association, presents in its 1930 Year Book, comparative statistical data presenting the actual twenty years' growth of the public recreation movement in figures taken from the annual reports of cities to the Association.

The accompanying chart, also from the Year Book, records 945 cities as providing public recreation leadership. In the tabulations which follow, the total of 763 cities represents those of the 945 reporting the operation of playgrounds (the data comparable with the 1908-1909 figures). Of the 336 cities reporting playgrounds in 1908-1909, it will be noted that only 267 reported the number.

	1908-1909	1929
Number of cities reporting playgrounds	336	763
Number of playgrounds	1,535 (267 cities)	7,681 (763 cities)
Number of employed recreation workers.	3,764 (259 ")	22,920 (806 ")
Total expenditures	$1,309,912.31 (184 ")	$33,539,805.79 (890 ")
Source of Support		
Municipal funds	62 cities	629 cities
Private subscriptions	66 "	134 "
Combinations	78 "	168 "
Managing Authority		
Park departments	67 "	218 "
Schools	83 "	152 "
Playground commissions	13 "	210 "
Other municipal departments	18 "	190 "
Playground associations	37 "	91 "
Other private organizations	140 "	192 "



Number of Cities Providing Recreation Leadership and Expenditures for Public Recreation 1909-1929

——— Expenditures

- - - - - - Number of Cities

Twenty-One Years of Progress in Fighting and Preventing Fires

By RALPH J. SCOTT

Chief Engineer, Los Angeles Fire Department; President, International Association of Fire Chiefs

WHEN the editor of THE AMERICAN CITY asked me to submit this article and specified the length desired, my first thought was that it would require considerable effort to produce that number of words. On more mature reflection, however, I find that it will be difficult to cover even briefly the comments I desire to make, without exceeding considerably the maximum length suggested. Most of us are still young enough to be living in the present and in the future. Until we consciously think of the past, we do not realize that we are passing the milestones, and that progress is being recorded at a rapid rate.

Outstanding Improvements

Twenty-one years have seen some decided improvement in the fire-fighting profession. May I suggest briefly some of the outstanding betterments—for there has been no retrogression—and later comment briefly upon each one separately. In the order of their importance, I have considered, perhaps excusably, the benefit they have been to the fire-fighting fraternity, the municipality, however, having benefited with each change:

1. Twenty-four-hour working system abolished.
2. Improvement in pension systems.
3. Improvement in comparative wages.
4. Firemen are educated technically.
5. Introduction of salvage work.
6. Introduction of rescue work.
7. Gasoline motors replace horse-drawn apparatus.
8. Fire prevention bureaus inaugurated.
9. Legislation supplements fire prevention work.

The Two-Platoon System

Above all in importance I regard the general adoption of what is commonly known as the "two-platoon system" of working hours. Twenty-one years ago, the fact that firemen were on duty 24 hours daily, was taken quite as a matter of course. Then some forward-looking departments conceived the idea that this was basically wrong, inhuman and un-American, and a long and strenuous campaign was begun to correct the situation. In the year 1915 the Los Angeles firemen took their proposal to the people by initiative petition, this being possible under an amended city charter, and after an active campaign the voters approved the plan. Opposition was made to the innovation by men and organizations that are now quite ashamed of their activities against this humanitarian measure. The City Council was against us and refused to permit the employment of the additional men that the operation of the new system required. The man who was then Chief of this Department was determined to carry the proposition through, and many fire stations were actually closed and the men distributed throughout the Department, making possible a reasonable trial of the new system.

This Department was one of the first to secure the two-platoon system, and had to defend it before the voters upon several occasions when certain organizations tried to take it away. They defended it with success, and this system is in effect practically everywhere in the United States at this time. Some have what is called the "three-platoon system," and I note that this matter is being agitated in New York City. The outcome in that city will be watched with interest.

The two-platoon system raised the morale of the Department as nothing else has ever done, for it made possible the enjoyment of liberty and leisure time by the firemen, and changed the engine-house from a prison to a place of employment. The job attracted family men and men who avowedly proposed to make the Fire Department their life work. Theretofore, no one ever took a job in the Fire Department except as a matter of expediency, and he usually quit when something better appeared. Discipline was difficult or impossible of adequate enforcement, the character and reputation of the rank and file such that it took years of effort and conscientious public service to live it down. Happily, the improvement has been brought about. Firemen are now entitled to and receive respect and consideration.

Improved Pension Systems

Twenty-one years ago, few cities had a firemen's pension system worthy of the name. The provisions of these systems were vague and uncertain, and their financial standing equally so. They existed for the most part at the pleasure of city legislators and therefore were at the constant mercy of the politicians. The application of the actuarial reserve system to pension laws and funds was never thought of. Many cities that had for some years maintained a pension system on this haphazard basis found themselves under the necessity of making drastic revisions when excessive demands were being made upon it. This led to the adoption in many large and progressive departments of other plans of financing, and particularly the re-establishment of pension systems upon a reserve basis.

In the Los Angeles Department the pension provisions are liberal, but the system is no longer supported entirely

by tax appropriations, all firemen being assessed 4 per cent of their salary, which is placed in the pension fund. A provision of the charter makes it possible to add a requisite number of cents and mills to the tax rate to make up the required difference, and these two major items, together with incidental sources of revenue, such as donations and proceeds from the sale of unclaimed property, guarantee the integrity of the fund. I believe that most departments are coming to recognize the fact that it is proper and desirable that members themselves contribute proportionately to the support of their pension funds. Since the adoption of the latter system in this city, the contribution of firemen has been more than sufficient to pay the expenses of service retirement.

It is necessary to retire firemen from active service at an earlier age than in most occupations. The people at large, however, are slow to admit this fact, and antagonism to the liberal provisions of the retirement law has been encountered at frequent intervals. The fact that the contribution of members themselves is sufficient to pay the expenses of retirement pensions is valuable to combat this argument. The people do not, of course, object to the maintenance of pension systems to take care of men disabled in line of duty.

Establishing a good pension system and including it, in its entirety, in the charter or basic law of the city, gives the men the assurance that it is secure from the influences of meddlers, and they consequently regard their pension expectations with the same confidence with which a man expects the maturity of an endowment policy. They feel that it is in a sense a vested right that no one is going to take away from them. They have been through many campaigns in which changes, modifications and revisions have been uniformly approved by the people's vote, and they believe they can successfully defend it again if called upon so to do. Hence, they value their present positions more highly, and men now entering the fire service do so with the conscientious intention of making it their life work. This encourages study and keen competition to secure promotions. Men are alert and on their toes all the time. Discipline may be established and maintained to the extent that the service requires, and the general result of contented employees, men who know in their hearts that they can do no better elsewhere, is toward the promotion of greater efficiency in the service. The labor turnover is small, for men do not resign usually, and what small turnover is had comes as a result of the application of departmental discipline.

As in all classes, the compensation of firemen has been increased. The salaries paid municipal employees do not rise, neither do they fall, with the readiness of salaries paid in private employ, and the tenure of employment is also more secure, which is an undoubted advantage. In the course of twenty-one years there has, however, been a steady trend toward adequate salaries in fire departments, until at this time the salaries of firemen, especially when considering pension expectations, compare very favorably with the compensation paid in other lines of endeavor. This increase in salary was made possible in the main by the fact that the fireman has raised himself in the public esteem. It has taken years of effort to bring this about, and the improvements I have outlined above have had more to do with it than any other factor that occurs to me.

Technical Education for Firemen

Of late years, keen interest has been shown in the matter of technical education for members of the fire-fighting fraternity. Some substantial beginning was made by the establishment of fire colleges and schools within the larger fire departments, and by the introduction of courses within the curriculi of established institutions of learning. The International Association of Fire Chiefs, while applauding all honest efforts along this line, believes that because of the peculiar nature of a fireman's work this educational activity can be best promoted within the fire department itself. The practice of fire-fighting is fraught with the greatest of uncertainties, and there are few professions in which theory is so much subordinated to practice in the attainment of proficiency. In addition, there has been but little standard text on the subjects necessary to be taught.

The International Association has this year placed upon itself the task of correlating material and methods of practice from sources all over the United States, and incorporating all approved material in standardized courses which will have the approval of the Association, and in the future presentation of which the strength and influence of the International will be applied. It is our ambition to help hasten the time when firemen all over the United States will be able to avail themselves of the opportunity to educate themselves in their chosen profession. More than ever before this education is necessary. The modern industrial developments of our civilization have introduced problems which academic training can do much toward solving. We believe that this constitutes one of the most vital matters confronting the fire department of today.

Salvage Work

Late years have seen the introduction of salvage work conducted as an integral activity of the fire department itself. By the term "salvage" is meant, not particularly the renovation of materials damaged by fire and water, but the protection of such materials during the progress of fire by covering them with waterproof covers or tarpaulins, and, operating from this basic principle, a great variety of refinements have developed in fire department salvage work, all looking toward the protection of personal property from preventable fire and water damage. There was some opposition to the introduction of this branch of the work; many believed and openly claimed that this was strictly an activity for the insurance companies to maintain. I have held for years that the first duty of the fire department was to eliminate preventable life and property losses, by whatever means were at hand, and, after an extended trial, our experience in Los Angeles has proved this contention to be in popular accord. Our salvage activities are being enlarged and there is no idea of future curtailment. Many thousands of dollars' loss from water damage is prevented annually, and this service has been the means of securing reductions of insurance premiums in this city—reductions which aggregate more than the cost to the city for the added protection facilities.

Rescue Work

Rescue work in most fire departments is a direct outgrowth of departmental needs. Years ago it was found desirable to maintain first-aid kits upon fire apparatus

for treatment of members of the department who sustained slight burns and minor injuries at fires. With the growth of departments, and the evidence of necessity to elaborate upon this service, it was soon apparent that carrying on fire-fighting apparatus the equipment deemed desirable would entail a great expense for units, with the result that one or more squads were devoted exclusively to first aid activities. As time went on, more and more of such facilities were provided and the attention of the public began to be attracted, and gradually the rescue companies began to respond to calls for first aid assistance. Especially with the addition of inhalator equipment, and the training of men in the proper operation of it, and in the science of artificial respiration, rescue work outside the fire department assumed important proportions. In my own experience, I have record of hundreds of lives of civilians saved through the work of our rescue companies. We respond to calls of all character where artificial respiration is indicated—drowning, still-births, gas asphyxiation, heart failure, pneumonia and other well-known causes involving cessation of natural respiration. The rescue service is an important manifestation of the fire department adage that the department exists for the protection of life and property, and the public generally is appreciative of this work.

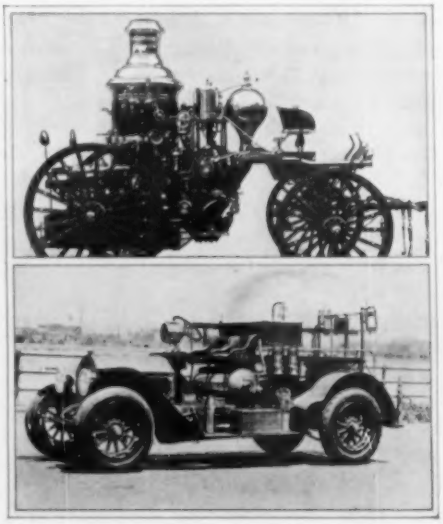
Motor Apparatus

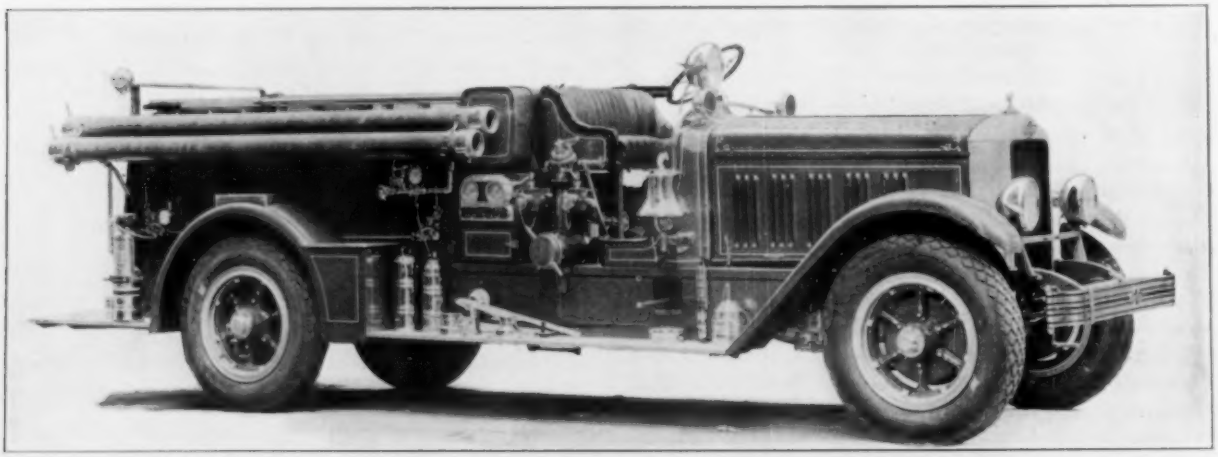
As this brief outline is an endeavor to cover twenty-one years of time, I should mention the complete transition from horse-drawn to motor-propelled fire apparatus. The fire department was one of the last public agencies to supplant the horse with gasoline as a dependable motive power. The year 1919 saw the complete replacement and official retirement of all fire horses in the Los Angeles Department. Incidentally, the horses were actually retired, and quartered in favorable circumstances in one of the public parks, and at this writing twenty are still living and in good condition, although they are growing very old. Although the loss of the fire horses removed a great deal of the romance from fire fighting, no one will question the fact that the motorization of apparatus was a great step in advance. By the motors, the area of territory that could be served by one piece of apparatus was increased many-fold. The development of pumps, with the increased power available, has made the modern pumper the equal of several of the old-time steamers in point of efficiency.

Fire Prevention Bureaus and Appropriate Legislation

Practically all modern fire departments now have fire prevention bureaus or their equivalent, for the idea that fire prevention goes hand in hand with fire extinguishment has taken firm hold in the minds of fire department executives everywhere.

Most fire departments are well backed-up by municipal laws with respect to fire prevention measures. The modern fire department is active to secure legislation to enable the correction of known fire hazards, in order to have other dependence than upon education and moral suasion to bring about their correction. Building laws, which are becoming standardized, have been of tremendous value to fire departments in the elimination of the commonest hazards, and the strict control of the building and maintenance of garages and filling stations, including the transportation and distribution of such highly dangerous products as gasoline, has been a vital factor in keeping fire losses down. Electricity, gas, chemicals, petroleum products, and other modern necessities have contributed greatly to our fire losses. Fire prevention bureaus and appropriate legislation have been indispensable in keeping these losses from becoming excessive.





THE EVOLUTION OF FIRE-FIGHTING APPARATUS

In 1910, the manufacturers of the then commonly used American-LaFrance horse-drawn steamer (shown in the top illustration) turned out their first piece of motor-driven equipment (shown in the middle picture). This was delivered to Lenox, Mass., where it is still in use. In marked contrast is the 7,004th piece of motor fire apparatus (also illustrated) built by the American-LaFrance and Foamite Corporation, and delivered to the city of Chattanooga in 1930

Police Progress in Practice and Theory

By AUGUST VOLLMER

**Chief of Police, Berkeley, Calif.;
Professor of Police Administration,
University of Chicago**

Photograph by Harris & Ewing

CONTRAST policemen of 1909 with 1930 and you will find the change that of brawn to brain, illiteracy to scientific training. Contrast methods of police organization and you will find: the discard of heavy, lumbering, foot patrolmen for alert and fast motor-mounted policemen; the abandonment of guessing methods for the infallible finger-print identification system and a national clearing-house for criminal records; the giving-up of hit-or-miss traffic control for scientific engineering and mechanical appliances and principles; the forsaking of sidewalk tapping with clubs to attract the attention of officers on the beat for the modern visual and audible recall system; the rejection of mouth-to-mouth methods of transmitting messages to patrolmen, in favor of police radio communication; the change from no statistics whatsoever to a uniform crime record system operating under and controlled by the Department of Justice.

Slowly but surely police departments are emerging from the political mire which submerged them and are now beginning to take their place with other branches of public administration that have been established on a sound business or scientific basis. Gradually, through improved selective methods there are being recruited for the police service, men of superior intelligence who are graduates of high school and are known to be of excellent character.

Policemen are commencing to make their presence felt in those departments where police heads recognize that police personnel was a big police problem and where they have utilized the service of scientists and scientific methods and instruments of measuring candidates for police work.

Were it not for the fact that so many police departments are so hopelessly handicapped by politics and are prevented from functioning efficiently for the communities they serve, it would be difficult indeed to believe that intelligent American citizens could ever have tolerated the deplorable police conditions that distinguished the police departments of the United States twenty-one years ago.

The Police Department a Modern Business and Scientific Institution

Comparing quality of service now given by an up-to-date police department with the police department in the cities which are politically ridden or held down by old traditions, is much like comparing modern civilization with the civilization of the Stone Age. The modern police department is an up-to-date business institution conducting its affairs on a solid business basis, and to the fullest extent utilizing principles of the several sciences and gradually developing principles peculiar to police service.

Forty or more police departments have recently installed radio transmitting stations, and thereby send out emergency calls to patrolmen who are patrolling beats in automobiles. Many criminals have been apprehended by radio-equipped policemen before they have had an opportunity to escape from the scene of their crime. Murderers have been caught, figuratively speaking, with the blood of the victim on their hands. As a matter of fact, in Detroit a murderer was caught immediately after the crime was committed, with the lethal instrument still in his possession. Hold-up men have been apprehended before they had an opportunity to escape with their loot. Burglars have been caught on the premises while engaged in stripping the store or residence. From the time the message is received at the police station until the criminal is arrested, is frequently now a matter of seconds and not of minutes, hours or days as was true in the past.

Modern departments recognize the fact that they must speed up in order to keep abreast of the times, and cannot hope to combat the crooks' activities unless they are equipped with modern devices of every character. Hence, signal lights, horns and bells and telephone alarm boxes are placed at strategic points in sufficient numbers so that a single police officer, or the entire force, may be communicated with and made instantly available when needed.

Scientific Crime Detection

Scientific crime detection laboratories have been established in the police departments of several cities of this country, and some of the miracles performed by police laboratory technicians seem too wonderful to be true. A single hair in one instance has furnished the clue which ultimately led to the arrest of a persistent prowler; and in another case where a number of persons were held up at the point of a gun, the suspect who had been identified as the culprit by six witnesses was positively eliminated by a few hairs found on a razor which was dropped by the robber. Imprints of teeth marks on a metallic bottle stopper definitely fixed the identity of a society thief in Los Angeles. A pistol found on a suspect arrested in Detroit was proved by the ballistic expert of the Detroit Police Department to be the weapon used in a murder which occurred in Cleveland. A murder suspect positively identified by three witnesses was cleared by the polygraph or so-called lie-detector. Subsequent events,

including the arrest, positive identification and confession of the actual perpetrator confirmed the record obtained with the aid of the polygraph.

The criminal investigator in modern departments has many tricks in his bag. As has been shown by the aforementioned cases, instruments of scientific precision are used; besides, there are many other aids recently developed which are used, notably the Modus Operandi system devised by Atcherly. By the use of this system the manner in which the criminal operates is recorded in the reports of the officers, so that future depredations of the criminal are quickly identified as the work of a previous offender.

The person who has been attacked, the property or place of attack, how he was attacked, the weapon or means used, the property stolen, time of occurrence, and many special characteristics of the individual, assist the investigator in limiting the scope of his investigation. It may be that the type of building entered or the property that is stolen is the sole clue, but all of the several divisions of the Modus Operandi system play an important part in establishing the identity of the perpetrator of the crime and frequently lead directly to the culprit.

The Importance of Records

Information acquired by officers is reduced to a code and then transferred by a punch to tabulating cards. These cards are filed according to the kind of crimes committed. When the perpetrator of the crimes is arrested, the several offenses for which he has been found to be responsible are connected by clerks. Later, when similar crimes are committed in the community and search is being made for the offender, the cards are run through the sorting machine by identification clerks. Those cards containing the same code or description of the same method of operation are separated from the rest. In this manner professional crooks are readily identified and their apprehension soon follows.

Information obtained from the officers' reports, which is transferred to the tabulating cards, has other values which are used to advantage by executives, such as the time of attack, the place of attack, and the type of crime committed. When it is found that the same offense is occurring with great regularity in the same area and at about the same hour, special details of police are organized and placed on duty in these infested sections during the hours that the crooks are operating. Needless to say, the results are disastrous to the crooks.

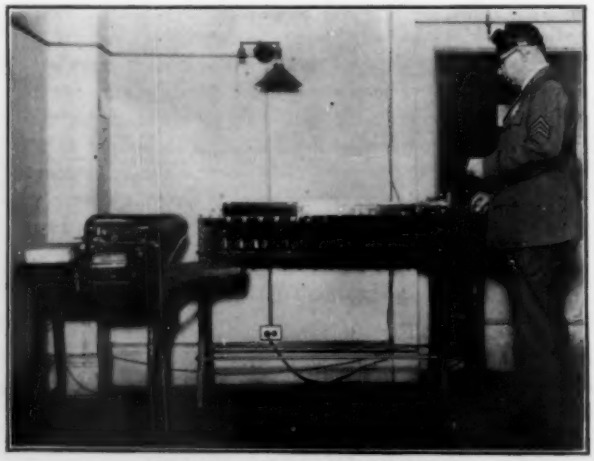
Fingerprint impressions are an invaluable means of identification, and the fingerprint system has come to be widely used in this country. Only very inferior or backward police departments fail to take fingerprints of criminals. Thirteen states have created central clearing-houses for these criminal records, and for the past seven years the Division of Identification of the United States Department of Justice has acted as a national clearing-house for fingerprint records. Incidentally, this Division has recently been legally established as a central receiving-station for all crime and criminal records. Soon we shall receive from this Federal agency the true story of crime and criminals, based upon facts obtained from police records and not from the imagination of fiction writers.

Present Methods of Crime Prevention

Crime prevention has been discussed at police conferences ever since police chiefs have assembled for the purpose of exchanging views and improving the police service. Crime prevention, however, meant to the old-time police officers improved punitive measures; that is, criminals must be caught promptly, sent to jail without delay, and kept there indefinitely. That was the beginning and the end of their conception of preventive measures. That there might be another approach did not dawn upon them until recently. Even now there are hundreds of police executives who have little or no appreciation of the value of the modern methods of crime prevention. Fortunately, there are a sufficient number of department heads who have kept abreast of the times and are alive to the possibilities of the several social sciences. Aided by socially minded policemen and trained policewomen, they are attacking crime at its source. The results justify crime prevention divisions in every department.

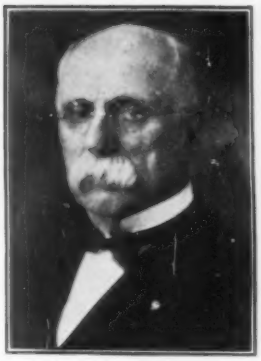
Hampered by old traditions, prevented from functioning by crooked politics and handicapped by dense ignorance, the policeman of twenty-one years or more ago made little progress. However, vast strides have been made in recent years, and one must be dull indeed who cannot foresee professionally trained policemen in the future who are scientifically equipped to prevent crime and to apprehend criminals.

POLYGRAPH OR LIE DETECTOR
One of the instruments of scientific precision in use in the Berkeley Police Department, Berkeley, Calif.



PUNCHING AND SORTING MACHINES
These are a part of the crime-record mechanism in use by the Berkeley Police Department

Recent Progress in the Treatment of the Criminal



By HASTINGS H. HART

Consultant in Delinquency and Penology, Russell Sage Foundation

PROGRESS in the treatment of criminals during the last twenty-one years has been in two opposite directions—forward and backward.

Distinct forward progress has been made in the recognition of the need of dealing with criminals as individual human beings who differ in their character and capabilities almost as much as the members of society who are not recognized as criminals.

Twenty-one years ago comparatively little attention was given to the physical condition of the inmates of our prisons. Medical service varied greatly in quality; it was often part-time work by incompetent men. This condition still prevails in most of the county jails of the United States; but in many state prisons there has been a great increase of careful medical and physical examinations and the hospital service has been improved. Dental service is now provided in many prisons, and efforts are being made to furnish an adequate balanced diet; and sanitary conditions as to lighting, cleanliness, sewerage, and ventilation have been improved.

About twenty years ago the first comprehensive efforts were made to ascertain the mental condition of persons accused or convicted of crime. Psychiatrists are now regularly employed in Massachusetts, New York, New Jersey, Pennsylvania, Ohio, and Illinois. Gradually, psychiatric service is being provided in certain adult and juvenile courts. In Massachusetts provision has been made by law for the examination of selected prisoners in county jails. In the state of New York a psychiatric corps has been established at Sing Sing Prison, which receives about two-thirds of all state convicts.

Heretofore there has been practically no systematic training of officers or employees in penal institutions, but a very significant forward movement has been undertaken in the establishment of the Keepers' Training School in New York City, and the United States Training School for Prison Officers, located also in New York.

A recognition of the primary importance of the quality of the personnel in the heads of public institutions, as well as the rank and file of their staff, is one of the most hopeful signs of the times in the field of penology.

Probation

Under the probation system persons convicted of offenses against the law who are not believed to be vicious and incorrigible may be released without imprisonment, but remain under the control of the court and in care of selected probation officers. It is generally recognized that the use of probation should be restricted to individuals who are deemed to be reformable and that the success of the methods depends upon having a trained and devoted staff of probation officers.

The system has been more fully developed in Massachusetts than in any other state, and the prison population of that state has been reduced more than 50 per cent, while it is claimed that crime has been largely diminished. A recent report showed that the state of Massachusetts had about 20,000 persons on probation who under former laws might have been sent to prison. Adult probation has been used extensively in the state of New York, its success depending chiefly upon the quality of the probation staff. The system has been unsuccessful in states where the appointment of probation officers has been controlled to a greater or less extent by political influences.

In the states of Massachusetts and New York considerable use is being made of a system which is also extensively used in Great Britain. It has long been customary for judges to impose upon minor offenders alternative sentences of fine or imprisonment. A fine is imposed which may run from $5 to $500 or more. If the prisoner is able to pay the fine, he immediately goes free; if he is unable to pay the fine, he is committed to prison with a credit of a certain daily allowance until the fine is worked out. In the meantime he may sit in idleness while his family is suffering from lack of support of the breadwinner. Under the new plan the fine is paid in installments of $2, $5 or $10 a week, according to his ability, and he is under supervision to make sure that he holds his job and supports his family. Every week he is required to come to the court and pay his weekly installment, and is thereby forcibly reminded of the fact that he is a violator of the law and must pay the penalty.

Parole

Under the parole system, authority is given to the prison board or to a parole board to release a prisoner before the expiration of his sentence, the prisoner remaining in the custody of the prison authorities or the parole authorities. Usually the prisoner is not paroled until a job is provided for him, and he must sign an agreement to hold his job, to contribute to the support of his dependent family, to abstain from drink, to keep out of bad company, and generally to conduct himself as a respectable citizen. He is subject to supervision by a parole officer, to whom he must report at frequent intervals. If he violates the conditions of his parole, he may be returned to prison by the parole officer at any time, without a new

trial. Parole is often thought to be a form of pampering prisoners, but this is not the case, if it is properly administered. The parolee is still in the custody of the state and under supervision which may become irksome.

The parole system has been justly criticized in many states because of inefficient organization and administration. Incompetent parole officers have often been selected by political favor, and an insufficient number of parole officers have been provided. Competent experts believe that a parole officer should not be required to supervise more than 50 persons, but it is a common thing to assign from 100 to 200, or more, to one officer. A case was reported of an adult reformatory which had 800 prisoners on parole, with only one parole officer. Each of the three Federal prisons has a single parole officer, but these parole officers can do no outside work, because their time is consumed in preparing cases for the parole board. However, Congress has just passed a law providing a separate Federal parole commission, with appropriations for an adequate staff and facilities.

In some states, as in Minnesota and Indiana, the parole boards are not permitted to receive petitions or to hear arguments from attorneys or other persons in favor of parole of the individual. The question to be determined by them is: Has the applicant developed such a character that there is reasonable ground to anticipate that he will lead an upright and honorable life, if released?

Crime Waves

A widespread popular impression prevails that there has been a great increase of crime in the United States during recent years. Unfortunately, we have in the United States no reliable statistics as to the number of crimes reported to the police, the number of arrests, the number of persons brought to trial, or the number convicted; and we have no means of comparing these facts from year to year. The Committee on Uniform Crime Records of the International Association of Chiefs of Police began in 1929 the collection and distribution of facts with reference to crime as revealed by police records. This laudable undertaking is still in its early stages and comparative figures are not yet available.

The popular impression has prevailed also that there has been an extraordinary increase of the number of crimes committed by young criminals; but here again there is a lack of supporting facts. Warden Lewis E. Lawes of Sing Sing Prison has made a careful study of the ages of prisoners committed to Sing Sing, and he states that the proportion of young criminals is almost exactly the same at the present time that it was fifteen or twenty years ago.

Reference is frequently made in the public press to the great increase in juvenile delinquency; but there are no statistics to support this statement. The Children's Bureau in Washington recently made a study of the number of children brought into the children's courts of the leading cities and they reported that in the majority of these cities there was an actual decrease of cases brought in the juvenile court. Many of the juvenile reformatories of the country show little or no increase in their population. A decrease is shown in the number of children brought into the juvenile courts, because of the work of the juvenile courts themselves and because of the increase of such agencies as the Boy Scouts, boys' and girls' clubs, and public playgrounds.

State Prisons, Adult Reformatories and Workhouses

During the past twenty-one years there has been a visible and admitted deterioration in most of the Federal, state, and local institutions for convicted prisoners in housing, sanitation, and industries.

Prison building was largely discontinued during the great war, and since that time has not overtaken the normal increase of the prison population. The two Federal prisons at Atlanta and Leavenworth are admittedly overcrowded more than 100 per cent of their normal capacity. Very great overcrowding exists in the state prisons of many states. In numerous states ancient and wornout buildings are in use. In the state of New York, in three state prisons and in the New York City House of Correction, there are hundreds of cells which are approximately 7 feet long, 7 feet high, and 3½ feet wide, without plumbing or adequate ventilation. The state of Missouri is keeping two or three men each in cells designed for one man, and is keeping five to seven men each in cells designed for two men. Numerous similar examples could be cited.

In many cases, as, for example, in Wisconsin and in the city of New York, prisoners are being confined in buildings which are firetraps, thus exposing them to constant danger of cremation.

It is an exception when a prison has an adequate and well-planned dietary. Usually, prisoners are fed too much meat and too few vegetables. Sometimes the funds provided for feeding are inadequate; in other cases they are wasted for lack of economic handling of materials. Vigorous efforts are being made in many states to remedy these evils, but they are still far from successful.

Prison Riots

At least eight major outbreaks have taken place in the prisons of the United States within the last twelve months, including the following: Clinton Prison, Dannemora, N. Y., July, 1929; Auburn Prison, Auburn, N. Y., July, 1929; Federal Prison at Leavenworth, Kans., August, 1929; Colorado State Prison at Canon City, October, 1929; Missouri State Penitentiary, Jefferson City, March, 1930; Rhode Island State Prison, Howard, April, 1930; Ohio State Penitentiary, Columbus, April, 1930.

There has been much discussion as to the cause of these prison outbreaks. They are not due to any single cause, but the following conditions already commented upon have undoubtedly contributed to them: first, housing conditions; second, inadequate dietary; third, idleness of a large proportion of the convicts; fourth, lack of classification; fifth, inefficient and inadequate personnel, with frequent staff changes both of executives and members of the rank and file; sixth, loss of hope because of longer sentences, restriction of the use of the parole system and in allowances for good conduct and faithful labor, and in the tendency of governors to diminish the use of the pardoning power.

Hope for freedom is the greatest incentive to good conduct in prisons and hopelessness often leads to desperation.

Street Traffic—
Past and Future

By MILLER McCLINTOCK

Director, The Albert Russel Erskine Bureau, Harvard University

THE notable years during which THE AMERICAN CITY magazine has recorded urban developments have shown many important changes in city life. Among these, certainly none is more spectacular than that which has taken place on the city streets. Traffic was a problem of which the city officials of 1909 were scarcely cognizant. The 305,950 passenger cars and 6,050 motor trucks in use throughout the country in that year were still largely novelties. Only the more venturesome prophesied that "the motor car has come to stay," and certainly even the most sanguine could not have anticipated that two decades could see the practical disappearance of the horse, and total automobile registrations amount to more than 27,000,000.

In the earlier year the "scorcher" was just becoming a problem, and injuries from runaways were more frequent subjects of conversation than those resulting from automobile mishaps. Yet the intervening years have shown such increases that the annual street and highway death-rate total now exceeds 30,000. Congestion and accidents have assuredly made street traffic one of the major physical problems confronting city administration.

So rapidly has the problem developed that there is little wonder that cities laid out and operated as horse-and-wagon towns have found difficulty in adjusting themselves to the requirements. Yet the advance which has been made is very noteworthy and points definitely to the fact that cities can and will master the more critical aspects of the problem.

Traffic Engineering Is an Established Profession

One of the principal difficulties has been to establish a professional attitude toward traffic planning on the part of public officials. City councils and police departments were the natural inheritors of rule-making and enforcement activities. In general, their efforts were sincere and competent within the limits of established practice. But this could not counterbalance the lack of intelligent technique and organized and responsible administration when almost over-night the larger cities found that their simple "crossing" difficulties had been converted into a complicated and costly city-wide transportation problem. Fortunately, a sound and well-established technique in traffic control and planning is now available for any city that desires to use it.

More than a dozen of the larger cities and several states have established traffic-engineering offices capable of administering local traffic control, and responsible for proper developments to meet constantly changing difficulties. With the examples which have been set, there is no longer an excuse for any municipality to use amateur and wasteful methods in traffic control. Such technical services are in no manner in competition with police and councilmanic powers, but simply a servant to render them more effective. With present advances, it is safe to say that another ten years will see traffic-control engineering generally established as a routine administrative service in all the larger cities.

Uniformity in Traffic Regulation

With forty-eight states and many hundreds of cities empowered to control traffic, it was inevitable that the early stages of traffic regulation should show an almost utter confusion in control rules and methods. To some extent this confusion still exists, but the progress which has been made toward uniformity in essential rules of operation is scarcely short of remarkable. The action of President Hoover in calling the National Conference on Street and Highway Safety, while Secretary of Commerce in 1923, has borne rich fruits. The deliberations and conclusions of the first and two succeeding National Conferences have resulted in regular progress toward actual national uniformity, and more particularly in intelligent and uniform thinking on traffic matters by officials in all parts of the country. The question of national uniformity is not yet one of the past, but it is rapidly becoming so.

In general, the view of the traffic problem of the future may be said to be optimistic. Basic and sound uniform standards are being rapidly written into law, and individual cities are providing competent administrative agencies to deal with local difficulties. It is not too much to say that the decade of the thirties may well show definitely lessened increases in traffic accidents and congestion in the more progressive cities.

This does not by any means lead to the conclusion that the traffic problem is extinct. Future pressure will require far more drastic changes than any that have been contemplated in the past. Some of the basic requirements may be briefly mentioned.

What Does the Future Demand?

It will be necessary to obtain an entirely new concept of street design and layout. Orthodox planning and replanning methods can only scratch the surface. Streets and highways of tomorrow must be designed in detail to meet the control requirements of automotive traffic. In congested districts separation of grade for essential traffic

Photographs from Ewing Galloway

movements now in conflict appears inevitable.

Similarly, the future will demand new concepts with respect to architectural design. After more than twenty years of growing street difficulties, during the last ten of which saturation has been imminent and the ultimate implications clear, central district structures are in general still built by classical rules which are utterly inconsistent with obvious traffic and transportation requirements and limitations.

In habits as well as in physical design, cities of the future will be forced to definite changes. Traditional customs have piled peak loads on peak loads until the daily use of city traffic and transportation facilities illustrates a woeful and desperately costly inefficiency in an age which boasts of its capacity to gain maximum returns from its physical equipment. With all control and design improvements which can be anticipated, increasing concentration will force basic time shifts in essential operation and a staggering of requirements which are now closely, though illogically, synchronized.

No one of these future demands is in the least impossible of satisfaction in strict consistency with economic limitations. In fact, some of the changes mentioned are such that vast economies would accrue, far more than offsetting the capital expenditures or difficulties involved in the shift. Progress is already apparent; and in habits and design, as well as in administration, it is safe to say that cities can and will adjust themselves to and master their traffic difficulties.

(LEFT) LOOKING DOWN WALL STREET, NEW YORK

MAIN STREET, HUNTINGTON, LONG ISLAND, DURING A DAILY RUSH HOUR

Two of the main causes of traffic congestion in cities large and small are illustrated in these photographs of New York City's financial center and the shopping center of one of its suburbs. The former shows the needlessly intensive use of land. The latter shows failure to control automobile parking in the public streets

We Can Reduce Traffic Accidents If We Want to

By SIDNEY J. WILLIAMS
**Director Public Safety Division,
National Safety Council**

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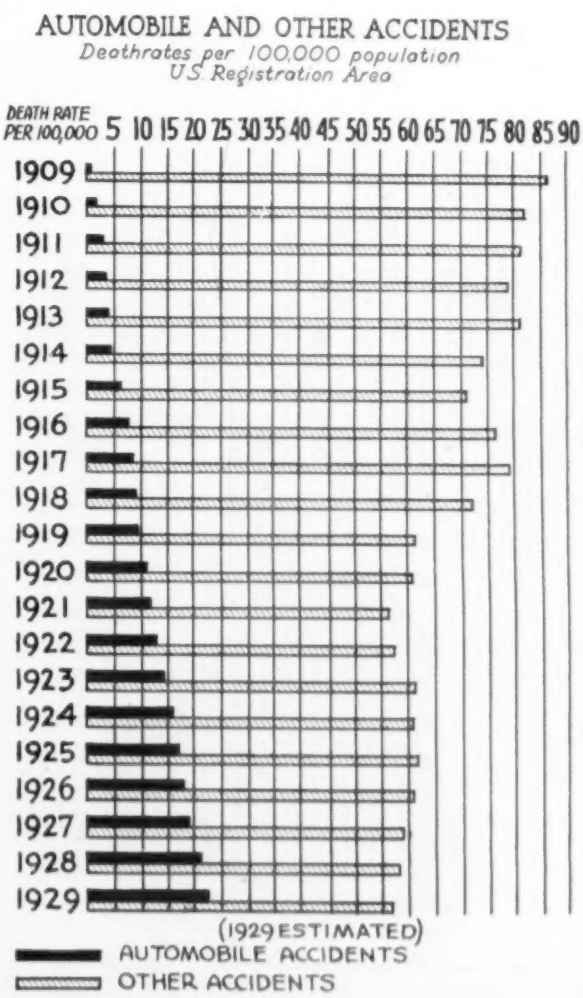
IN 1909, the year of THE AMERICAN CITY's birth, the building contractor for whom I was working as superintendent said one day, "While I'm on my vacation you might as well use my machine." The "machine" was a one-cylinder Brush runabout which, when in good trim, could be pushed to a speed of 20 or even 25 miles per hour. It was a big help in getting around the city from one job to another. That was my first experience in driving an automobile, of which, in that year, there were some 312,000 in the country, or one to every 300 inhabitants. As I drove my Brush about the streets of Milwaukee, the only sort of accident that I feared was that the contraption would stop or that a frightened horse would run away. "Autos" were in fact prohibited on certain boulevards and pleasure drives. The Census Bureau did report, however, some 1,200 deaths that year from automobile accidents. Scarlet fever claimed nearly ten times as many victims. Since then preventive medicine has greatly reduced the deaths from scarlet fever and, with the mounting automobile toll, the position has been reversed—last year motor-vehicle deaths were more than ten times as numerous as those from scarlet fever.

Our "progress" since then, in these two decades, has been to increase the number of motor vehicles by more than 8400 per cent and the number of accidental deaths by more than 2400 per cent, while the national population was increasing by about 33 per cent. During the first fifteen years of this period, the number of deaths per thousand vehicles declined rapidly, but in recent years even this slight consolation has been lacking, and the deaths have increased as fast or faster than the registrations.

In 1909 there were plenty of accidents in industries. "Safety" as a major national movement was hardly dreamed of. Definite accident prevention activity had just begun, in a handful of progressive manufacturing plants and railroads. Not long after, a few enterprising electric railway systems enlisted the aid of the schools in teaching children the hazards of the streets—which then meant largely the hazard of being hit by a street car, a type of accident which, by the way, has steadily declined as the result of these efforts. In 1913 the National Safety Council was organized. In 1918, by which time the number of vehicles had increased twenty-fold, and deaths eight-fold, the first comprehensive community safety campaign, in Rochester, N. Y., under sponsorship of the Rochester Chamber of Commerce and the National Safety Council, established standards and methods which are still valid.

Progress and Setbacks in Traffic Control

Even to list what has happened, what we have learned, what we have done and what we have failed to do in twenty-one years of traffic safety effort would far exceed the space allotted. Readers of THE AMERICAN CITY already know that there is no panacea for accidents; that a safety program must include the elements of engineering improvement, education of all users of the highway, and strict enforcement of reasonable laws to curb the indifferent and the reckless. They know of the remarkable development of street and highway engineering, the



emergence of the science and art of traffic control, the gradually developing technique of police administration, the rise of traffic courts and traffic violations bureaus. They are familiar with the rapid spread of safety training in the schools and the successes of the school boy patrols; the use of industrial safety methods, for reaching commercial drivers in fleets; the organized campaigns of community safety councils and other local organizations; and the great impetus given the entire movement by Herbert Hoover and Robert P. Lamont through the series of National Conferences on Street and Highway Safety, and especially the growing snowball of uniformity through adoption of the Uniform Vehicle Code and the Model Municipal Traffic Ordinance and adherence to the Traffic Sign and Signal Code. And they are all too familiar with the mounting tragedy of 31,000 deaths and a million injuries in a year; the discouraging spectacle of "good citizens" flouting the laws, corrupting or trying to corrupt the police and the judiciary, and blindly opposing remedies of proven value; the indifference and the petty jealousies that make progress so difficult.

From amid this complex of achievements and failures, this welter of opinions and practices still only partially reconciled, can any clear conclusion be drawn, any certain path of progress be discerned?

Public Opinion Must Support Community Control

Yes, to any serious student of the situation one fact becomes clearly evident, and it is this: in every place or every group where real *control* has been exercised, traffic accidents have been arrested if not reduced. Recent studies of the National Safety Council, of accurate statistics from a large number of representative cities and states, show that accidents involving commercial vehicles have slightly decreased; that deaths of school children have slightly decreased; that deaths in cities having a community safety council have increased very slightly; that deaths in states having an effective license law with centralized administration have increased much less than the average; that deaths of pedestrians of all ages, throughout the country, have increased only slightly; that the big increase has been among private passenger vehicles in places having neither a community safety council nor a driver's license law.

It takes no great imagination to attribute the favorable showing of the commercial drivers to the persistent campaigns of education and supervision combined, by fleet owners and their organizations; the favorable showing of the school children, to the similar combination of education and supervision by the school authorities; and the favorable showing of the license law states, to the control exercised by the state motor-vehicle bureau through examination of new drivers and suspension or revocation of licenses for illegal or reckless conduct. Likewise, the community safety council programs which have succeeded have included the same combination of persistent education of all ages and classes and tightening-up of law enforcement through the mobilization of public opinion to support the police and the courts.

We can reduce traffic accidents if we want to. We cannot do it by mere talk. We cannot do it by subscribing to educational campaigns and then continuing individually to drive as we please and to have our cases "fixed" if arrested. We cannot do it by passing laws and not enforcing them. We can do it only by recognizing that the motor vehicle is as powerful an instrument of harm in bad or ignorant hands as it is an instrument of utility and pleasure in good hands, and that therefore for the public good and for our own safety we must submit, cheerfully and honestly, to necessary regulations. We must practice self-control and we must practice community control.

TWO POSTERS OF THE PUBLIC SAFETY SERIES, NATIONAL SAFETY COUNCIL

Aeronautics and the Municipality

By CLARENCE M. YOUNG
Assistant Secretary of Commerce for Aeronautics

DURING the twenty-one years that have passed since THE AMERICAN CITY was founded, the science of aeronautics has made very gratifying progress. When the magazine was born, in 1909, flying in a heavier-than-air machine was only six years of age, and a mere handful of people had actually flown during those six years.

The dawn of a new era of aeronautical development came with the war. Research and production leaped ahead, accelerated by the enormous demands of the various fighting forces.

Commercial and Civil Aeronautics Officially Recognized

But it was not until four years ago that commercial and civil aeronautics really came into being in the United States. Then, commercial flying was officially recognized by the Federal Government through the passage by Congress of the Air Commerce Act of 1926, which charged the Secretary of Commerce with the promotion and regulation of civil aeronautics. As a direct result of the Air Commerce Act, the Aeronautics Branch was established in the Department of Commerce, and the office of Assistant Secretary of Commerce for Aeronautics was created.

Partially as a result of this legislation by Congress, partially as a result of a number of pioneer flights which fired the public's imagination, and partially as a result of natural evolution and development, the science of aeronautics proceeded at that time to graduate from its experimental stage, and began to carve out jobs for itself in civil life.

Air mail first was attempted in a limited way and during daylight hours only. Now it is being gradually extended into practically every populous section of the nation and into other countries in the Western Hemisphere.

These lines have been the forerunners of passenger service, the connecting links between the first feeble flights of yesterday's uncertain experimental flying and the swift, reliable, day-in and day-out operation of today's regular scheduled air commerce. Furthermore, these scheduled operations are proving extremely beneficial to the aeronautic industry by causing large numbers of persons to become interested in aeronautics; and are contributing substantially to the nation-wide movement which already has provided in the United States approximately 1,675 airports and landing fields, and which in addition is proposing about 900 more for early development.

It is a gratifying commentary—in this connection—on the character and vision of American municipal leadership, that many of the cities and towns are not worrying because their airports are not yet paying dividends. They realize that some civic assets, like parks and airports, are essential to a city's present or future well-being—regardless of immediate tangible returns.

Airports Are Civic Assets

However, airports are by no means in the same category as municipal parks. They are more than mere pleasure centers—they are the very "highway" terminals through which air travel can flow. Air transportation must have some sort of terminal; and the better the airport, the more traffic will be attracted to that particular port.

The airport movement is still so young that scores of cities and towns have not yet had time to complete their airport projects. Some municipalities have had difficulty in financing these projects properly, and other important communities have, to date, failed to obtain for themselves any place whatever on the nation's air map.

Nevertheless, sufficient landing areas and so-called airports have now been provided, either by private capital or municipal bond issue, to make it possible for the 46 scheduled air transport operators of the United States, including those who operate from the United States into Canada and Latin America, to fly their airplanes an average of more than 119,000 miles every day in the year—of which more than half is accounted for by airmail service.

Figures That Show Growth

The mileage of air mail lines in actual operation today has now attained the unprecedented total of approximately 32,000. Further evidence of aviation's growth are the figures for airmen licenses, and for aircraft licenses, identifications and approvals. To date, the Department of Commerce has issued 59 approved type certificates for engines, 179 for propellers, and 352 for aircraft. Moreover, we now have 2,086 aircraft identified, 6,768 airplanes licensed, and 13,867 pilots' licenses active. Furthermore, there are now 10,124 student pilot permits active since the first of this year.

These developments show quite clearly that occasional temporary setbacks are powerless to stem the tide of aeronautical progress. The development of aeronautics we now are witnessing from day to day holds promise for the alert municipality, as every American city owes its own present size and prosperity very largely to modern transportation.

Aviation Flattens Topographical Obstacles

Were there no modern transport facilities—were there no street cars, no railroad trains, no steamship lines—it would be impossible to feed, clothe, amuse and otherwise support the vast populations which today are found in our cities. In the past, transportation developments have been confined almost entirely to surface media. In consequence, these media have been forced to struggle over or around or through topographical obstacles. Rivers, mountains, deserts, plains, all have conspired to retard the development of American cities. But the average American city has overcome these difficulties, has conquered these obstacles and barriers with tunnel and bridge—with railway and highway, with wire and wireless.

Aircraft, however, provide us with a quality of transportation and communication, a speed of transit and a directness of travel, which shrinks the map to a half or a third of its former dimensions. Air commerce literally adds whole hours to the pleasure day, whole days to the business week.

Consult the Federal Government's Specialists

The Federal Government, through the Aeronautics Branch of the Department of Commerce, is anxious to cooperate at every opportunity with the officials or leaders of individual American cities, in all matters pertaining to airports and aeronautics. Particularly are we glad to arrange conferences between our airport specialists and municipalities, chambers of commerce, and similar civic organizations desiring assistance in the selection of airport sites, or requesting information regarding requirements for the development of suitable airports.

Several airport specialists are available for this work, and are routed throughout the United States on carefully planned itineraries. They urge the importance of having experienced airport engineers make comprehensive studies and prepare plans for complete airport development, in order that every dollar invested in airport projects may be expended to the best advantage. It should be understood, of course, that the Department of Commerce representatives do not render engineering service.

Municipal officials and civic leaders interested in obtaining adequate airport facilities can obtain authentic and authoritative information by writing the Aeronautics Branch, Department of Commerce, Washington, D. C., for the following Aeronautics Bulletins, which may be had without charge, upon request: Airport Design and Construction; Air Marking; Air Traffic Rules; Airport Rating Regulations; Suggested City or County Aeronautics Ordinance and Uniform Field Rules for Airports; Notes on Airport Lighting; and Airport Management.

WHEN AIRPLANES FIRST APPEARED IN THE AMERICAN CITY

THE flying machine of familiar everyday use first cast its approaching shadow across the pages of THE AMERICAN CITY in these words on page 31, of the issue of January, 1911, in an article on "The Cities of the Future," by E. Hénard, Architecte de la Ville de Paris—words which, visionary and unrealizable as they may then have sounded, now appear almost imminently prophetic:

"The day is coming when the entire physiognomy of cities will be changed, when aerial automobiles will flit from roof to roof; when great elevators will serve equally to lift motor cars from subterranean garages to the ground level, and to carry aeroplanes to the roof stations. In those days there will have to be new traffic regulations for the now undefined aerial streets, and the entire city may be constructed on a zone system determined by distinction between the weight and character of various forms of aircraft demanding different kinds of landing places to insure public safety."

FLYING: THEN AND NOW

Photographs from Aeronautical Chamber of Commerce

A Curtiss June Bug, 1908 Model, is shown at the left

Below is the Fokker F-32

Advances in Public Health Administration

By HENRY F. VAUGHAN, Dr. P.H.
Health Commissioner, Detroit, Mich.

PUBLIC health administration is not a fixed and inflexible service. As the horizon of the sanitarian and hygienist has widened, there has naturally followed a reorganization and rearrangement of administrative procedure, laying particular stress and emphasis upon certain phases of health promotion which were ignored when municipal health departments were first organized in the United States. During the middle of the last century particular emphasis was placed upon the relationship between man's environment and his health. This ultimately resulted in an improvement of the water-supply and in the construction of engineering works for the collection and disposal of sewage and for the treatment and disposal of garbage and other waste materials. It followed quite naturally that, with the improvement in water-supplies and the focusing of attention upon municipal sanitation and house-cleaning, there was a reduction in the death-rate from typhoid fever, cholera and other water-borne infections.

Control of Communicable Diseases

For the control of the communicable diseases, systems of isolation and quarantine were instituted and maintained as early as the fourteenth century. The practice of quarantine with modifications has continued to the present day and is effective in preventing the spread of contagion from the sickroom to the public at large, but of no service in eliminating the spread of disease through the medium of healthy carriers and mild cases. It is important to remember that one must not, of necessity, have diphtheria, for instance, in order to be of danger to his fellow-beings. There are many healthy people who unknowingly carry the germs of this disease in nose and throat, and, although insusceptible themselves, may convey the disease to those who have no self-protection.

Knowledge concerning the important part which the individual plays in the dissemination of disease resulted in the creation of the science of bacteriology, which revolutionized our concept of the causes of disease during the last quarter of the nineteenth century. We found that isolation within itself cannot control a communicable disease. In addition, we must stimulate self-protection of the individual. For smallpox and typhoid fever we have vaccination, for diphtheria we have immunization with toxin-antitoxin or toxoid; for many other communicable diseases there are specific methods by which protection can be artificially stimulated. We have learned, therefore, that if a community is to be protected against unnecessary illness, and if positive health is to be promoted, we must depend upon the extension of health knowledge and must create in the mind of the average citizen a health consciousness, stimulating his reaction and response so that he will incorporate into his daily program the practice of hygienic habits.

Education in Public Health

During the past twenty-five years public health administrators have organized and remolded their health departments so as to build their organization about public health education as a nucleus. Most of this advance in procedure has taken place during the first twenty-one years of the publication of THE AMERICAN CITY. This magazine and similar publications have played a leading role in extending the usefulness of the knowledge which science has given us with regard to disease prevention.

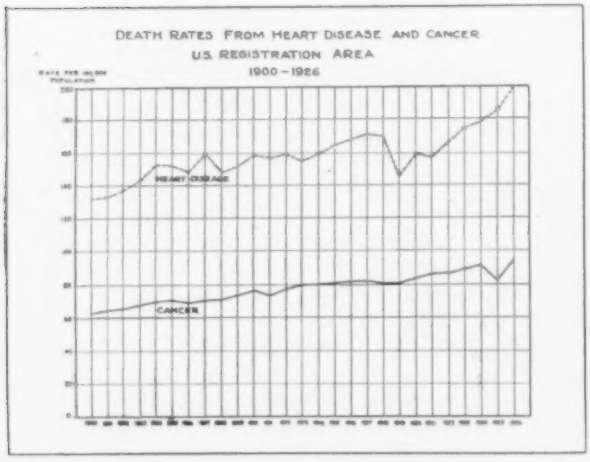
The public health nurse has come to the front as a teacher of hygiene. Twenty-five years ago she was an unknown factor in the scheme of health department organization, but today the well-organized health department is spending nearly 50 per cent of its available appropriation for public health nurses. She has become the health salesman, the intimate adviser of the family, the contact between the health department and the vast army of preschool and school children that the health officer must reach with his program of education.

There are three diseases the mortality from which has been distinctly influenced by the improvement of man's environment and by the promotion of health education. These diseases are typhoid fever, diphtheria and tuberculosis. For the first two, we have vaccination and immunization which will effectively protect the individual. For tuberculosis, improvement in personal hygiene, diet, mode of life, social and economic conditions, has contributed to a lowering of the death-rate. Health departments and tuberculosis societies have assisted through the establishment of hospitals, sanitoria, preventoria and special schools. In contradistinction to the marked reduction in the death-rate from these diseases in the United States is the mounting mortality from cancer and heart disease, which thus far has not been appreciably influenced by the organized health movement. It is only within the last few years that any attention has been given by health officers to the problems of cancer and heart disease.

What Public Health Protection Costs

There are available no accurate figures for the per capita expenditure for recognized public health activities

A CONTROLLABLE-DISEASE RECORD
Better living conditions and programs of public health education have forced mortality figures sharply downward for the group above charted



A RECORD IN CONTRAST
Heart disease and cancer still show mounting mortality rates, but there is hope in the attention health officers are beginning to give to them

prior to 1920. Figures are available for a limited number of cities which have responded to a recent questionnaire affording a comparison for the years 1920 and 1929. These figures are shown graphically and it will be observed that there has been a healthy increase in the per capita appropriation for these services, indicating a sympathetic response on the part of the public to the program of health education.

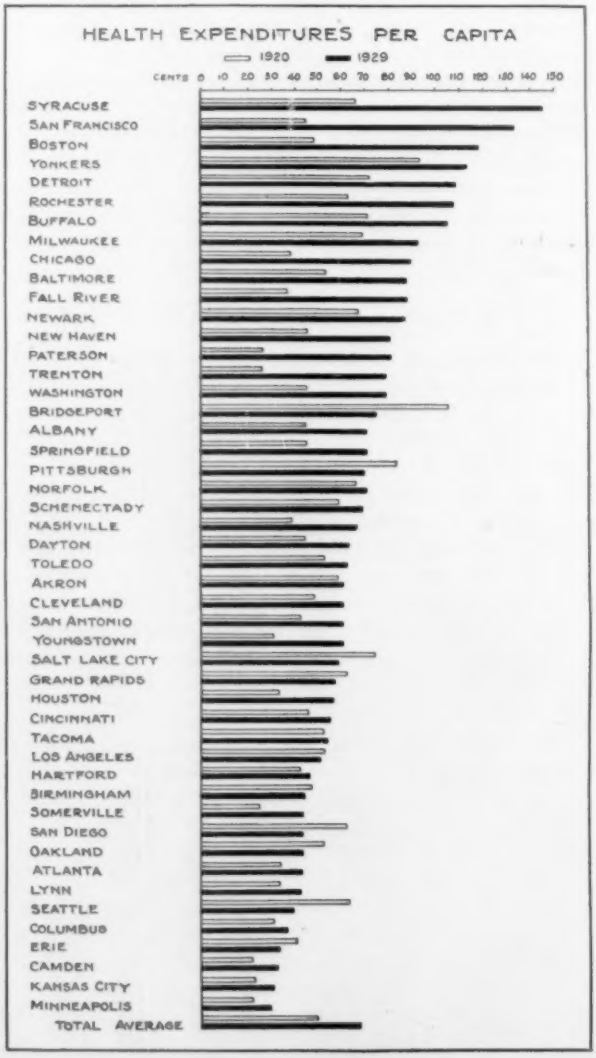
The Successful Health Department

The prime function of the modern health department is not, as many believe, to deal with the unusual pandemic of influenza or other devastating plague, but rather it is to teach positive health and to provoke a response on the part of the individual so that there will become established a health consciousness, resulting in the upbuilding of physical and mental resistance to infection. It may be said that the death-rate in any community but reflects the health consciousness of the individuals who reside in such community. The health department which is most successful is the one which is able to stimulate and activate the individual into the daily practice of the elements of personal hygiene and public health.

It may also be said during the past twenty-five years health departments have been reorganized with the view of performing three principal functions: first, to supervise man's environment in order to protect the individual against the health hazard which, to a large extent, is common to all; second, to work hand in hand with the parent in preventing the spread of contagion; and third, to teach the principles of positive and vigorous health.

In bringing to a successful issue such a program, the health administrator must stimulate, coordinate, and in so far as possible, standardize the work of the various organizations interested in the field of public health, to the end that the entire program will constitute a smoothly running effective machine. The interest and cooperation of the physician, nurse, bacteriologist, serologist, chemist, nutritionist, psychiatrist, educator, physicist, biologist, and, last but perhaps most important, the parent, is necessary if the desired goal is to be reached.

EDITORIAL NOTE.—Because of the large number of special anniversary articles appearing in this issue of THE AMERICAN CITY, a number of the regular departments have had to be omitted. This applies to "The Month in Public Health," which is conducted by Dr. James A. Tobey. This and the other departments similarly affected will be resumed in October.



Sanitation of Swimming Pools, Wading Pools and Bathing Beaches

By SURGEON GENERAL HUGH S. CUMMING
United States Public Health Service

WHILE swimming pools and bathing beaches are similar in that both are used for purposes of exercise and recreation in the water, from the standpoint of sanitation and protection from infections they must be considered as quite separate entities. The swimming pool, for example, is artificial or semi-artificial in character and may readily be brought under absolute control as regards both the condition of the water and the persons using it. The bathing beach, on the other hand, is not in itself subject to such sanitary control, nor in the majority of instances is it practicable rigidly to enforce provisions regarding the users.

The danger to health to which the user of a swimming pool may be exposed, assuming that the water used is of safe sanitary quality, is due primarily to excretions from other users of the same pool, while the danger in so far as a bathing beach is concerned is from pollution of the water by domestic sewage. Since the water at bathing beaches is not subject to local control, protection to bathers can be brought about only through restrictions as to use of such beaches. In the case of swimming pools, uniform regulations and control measures may be universally applied. Such is not the case with natural waters used for bathing, hence each individual bathing place must be considered by itself. To determine the probable safety of such a bathing place or beach requires much the same study as is necessary in determining the safety of a water to be used for a public water supply or, in the case of salt water, for shellfish growing purposes.

Bathing Beaches and Domestic Sewage

While it is considered that the bacteriological purity of water in a swimming pool should be on a parity with that of drinking water, it is not believed that this high standard is necessary in the case of water at bathing beaches. Just what the bacteriological limits should be is at present open to discussion. Several of the state departments of health have set tentative standards or limits, but there is a rather wide variance in these standards. Obviously, such standards should vary, according to the location and character of water at the bathing place. Fresh water bathing beaches should require a higher degree of bacteriological purity of the water than is necessary in salt water, since the probability of ingestion of water is greater in the first case. Furthermore, small lakes, since they more nearly approach the artificial swimming pool, will require a greater degree of water purity than will a large lake or river.

With the exception of certain bathing beaches patronized by extremely large numbers of people at one time, the danger to the health of the bather is principally that of contracting typhoid fever or other intestinal diseases through ingestion of water. Other infections attributed to the use of such water are probably small, due to the natural movement of the water carrying away such infectious secretions as may be produced by the bathers, and to the manner in which the bathing place is used. Since the danger is largely that of contracting typhoid fever or dysentery, open water in large streams, lakes, and bays can generally be considered safe if there is no discharge of domestic sewage nearby or if it is discharged at a sufficient distance above or away from the bathing place (as determined by time of flow to the bathing place) to allow for a reduction of pollution, through dilution or oxidation, to render the water safe. Especially dangerous is the practice of bathing off docks, wharves, and seawalls in the harbors of large cities or in rivers near and below such cities.

Sanitary control over the bathers themselves, so necessary in connection with swimming pools, is of less importance in connection with bathing beaches, and fortunately so, since such control is practically impossible as a general rule.

Popularity of Swimming Pools

The construction and use of swimming pools has increased by leaps and bounds within the past few years. This has been due to a number of causes, such as greater interest in sports and recreation by the general public, limitation of natural bathing places (the old swimming hole), and perhaps to some extent the swimming requirements in many of the schools.

According to the late Dr. Simon Baruch there were only 67 public pools in the United States in 1900. In 1913, Arthur M. Crane reported 540 pools, and in 1927 THE AMERICAN CITY's Municipal Index located 3,212 public and private pools in cities of 5,000 population and over. This number has undoubtedly greatly increased in the past three years. At present, not only is the number of public and private pools increasing, but semi-public pools are being installed in hotels, apartment houses, on steamships, and even in office buildings. With this enormous increase in the number of pools and in the number of persons using pools, the need of proper sanitary requirements as to construction, operation, and use is apparent.

In 1920, Hinman tabulated the diseases possible of contraction through swimming in polluted water as follows:

1. Intestinal infections, such as typhoid fever, dysentery, etc.
2. Infections of the respiratory system, such as grippe, colds, sore throat, and sinus infections
3. Eye and ear infections, such as conjunctivitis, rhinitis, and ethmoiditis
4. Gonorrheal infections
5. Skin infections

With proper control over the water used in pools, the chances of intestinal infections are greatly reduced, perhaps practically eliminated. However, such control will in no way reduce the other groups of infections unless the pool is so operated as to limit both the amount of infectious material taken into the pool by the users and the concentration of such infectious material in the pool.

Sanitary Standards for Swimming and Wading Pools

In 1918, the American Public Health Association appointed a committee to study the question of swimming pools and bathing places, and in 1920 the Conference of State Sanitary Engineers appointed a similar committee. These committees combined as a joint committee and since that date have been making a thorough study of the subject.*

In 1928 the joint committee published a report,† which was confined largely to construction and operation and use of swimming pools. It recommended the recirculating, or flowing-through, pool, since this type of pool permits of proper control over the quality of the water in the pool and permits constant and adequate disinfection.

The bathing load limit was set at 50 gallons per person using the pool where continuous disinfection was practiced, and at approximately 140 where such disinfection was not continuous. In many of the states this bathing load requirement has been increased considerably, in some of the states 400 to 600 gallons per person using the pool being the lower limit.

Of the various methods of disinfection, the committee considered that, based on the information available, the addition of chlorine, either as a gas or water solution by the use of proper apparatus, is at the present time the most satisfactory method of pool disinfection, since it is possible not only to disinfect the entire body of water in the pool but to maintain in the pool water at all times a residual amount of disinfectant sufficient to sterilize any dangerous pollution disseminated by the bathers.

Sterilization of clear water by exposure in thin films to ultra-violet rays and by ozone is practiced at some pools. Sufficient evidence, however, is not at present available to indicate that these two methods will insure residual sterilizing effect after the water has been treated, and the committee did not, therefore, recommend the use of these methods where bathing loads were high or where large temporary loads might occur.

Due to some irritation of the eyes and nasal passages, there has been some objection by users of pools to the maintaining of the residual chlorine in the pool water in an amount which public health officials think necessary. In this connection it is possible that the recently developed use of ammonia and chlorine will allow for the maintaining of much higher residuals in the pool water without production of odors or irritations.

Proper control should be maintained over dressing rooms, bath rooms, floors of bath houses, foot baths, etc. Infections of ringworm, toe itch, toe scald, fungus foot, papilloma, and other similar skin infections popularly known as athlete's foot, are to be avoided.

With the increase of construction of wading pools for the use of children in the public parks and playgrounds, it is necessary to extend to such pools the same careful system of supervision over sanitation that is or should be exercised over swimming pools.

There is at the present time an increased interest by public health authorities in the sanitation of swimming pools and bathing places. Many of the states and cities are now exercising careful supervision over such pools and bathing places, and such supervision should be extended until all pools and bathing places are operated in a manner to make them reasonably safe in so far as the danger of transmitting infections to users is concerned.

* See The Municipal Index for 1927, pages 476-483; 1928, pages 490-492; and 1930, pages 515-516.

† Public Health Bulletin No. 183 (Government Printing Office, Washington, D. C.; 25 cents per copy).

Letting the Creator of an Industrial Nuisance Supply the Remedy

THE best method of meeting the problem of nuisances arising from industrial, particularly chemical, operations was recently discussed by R. D. MacLaurin, Commissioner of Trade Waste, Cleveland, Ohio, writing in *Chemical and Metallurgical Engineering*. Two kinds of control in general use are segregation through a zoning ordinance, and specific legislation directed against the source of annoyance and attempting to diminish or abolish it. In Mr. MacLaurin's opinion, zoning is ineffective in many instances and interferes with property rights, while specific legislation is frequently ill-advised and merely punitive, sometimes tending to the destruction of an industry. He recommends that chemical engineers and others within the industries concerned should give careful study to nuisance prevention and develop satisfactory methods. An English law of 1875 points the way to the rational solution by undertaking to enforce *the best practicable means* of control, thus allowing remedies to develop along with advancement in scientific knowledge and practical application, while avoiding the mistake of prescribing without adequate knowledge.

As a suggestion for appropriate legislation to carry out this idea, Mr. MacLaurin presents the following:

"A permit shall be required for the conduct of each and every business or manufacturing operation which results in the emission of dust, fumes, odors, noxious gases, or offensive water-carried wastes, and no such business or manufacturing operation shall be permitted to be carried on unless the permit hereby required shall have first been obtained. A permit shall be issued provided each and every business or manufacturing operation shall be so conducted, and shall employ the best practicable means known to the art for the abatement and elimination of dust, fumes, odors, noxious gases, or offensive water-carried wastes; and such conditions of the business or manufacturing operation must be evidenced by the written approval of the Commissioner of Health.

"When adequate means for the abatement or elimination of dust, fumes, odors, noxious gases, or offensive water-carried wastes are not known to the art, it shall be the duty of the manufacturers conducting such operations to investigate and provide ways and means for abatement in cooperation with the authorized officials of a municipal corporation; and for the conduct of each and every such business or manufacturing operation, a temporary permit may be issued."

Progress and Possibilities in the Abatement of Smoke

By O. P. HOOD
Chief, Technologic Branch, U. S. Bureau of Mines

Photograph by Harris & Ewing

THE last two decades have shown some notable efforts in smoke abatement in such cities as Chicago, St. Louis, Cleveland, Cincinnati and Salt Lake City. In no case has complete success been attained in the sense of eliminating the problem and attaining clear skies. Based on the condition that would have been, however, had there been no special effort, considerable success can be claimed. It is generally conceded that an absence of smoke will be had only when smokeless fuels are universally used. This period has proved that, to be universally used, smokeless fuels must be no more expensive for the service performed than smoky fuels. At present such a condition exists in only a few localities. The dream of cheap processed fuels has not as yet become a reality, but it is a desirable ideal toward which there is much striving and which is realized in part.

A Major Problem

There is a growing appreciation of the fact that the maintenance of clean air in a city is a major problem comparable with the maintenance of clean water, clean streets and sewage and garbage removal. So long as it is considered a minor matter in municipal housekeeping, only partial and indifferent successes are obtained. The past twenty years have shown that the best method of dealing with the problem is to have an engineering service that can lead by demonstration and good advice, telling people just what to do and seeing that it is done. This means leadership, rather than spotting and fining offenders. It means control of all new installations and a program of continued education of firemen and citizens who care for their own furnaces. The engineering problems of the large fuel-burning plants are less acute as to black smoke than formerly, but far more difficult in respect to dust and gases. The part that domestic smoke plays in the nuisance has been demonstrated, and this still remains the most difficult part of the problem. The general introduction of small stokers for domestic furnaces seems possible and promises a great help in reducing smoke from this source.

A politician of long experience once said that a question which depended on a moral issue could command only about one-third of the vote, while if it was made to appear to be a business matter, it could command a good majority. Smoke abatement work has attempted to justify itself by appeal to a number of different reasons, but no single argument has been sufficient to command a good, vigorous majority.

To abate smoke as a duty to the community appeals to less than a majority. The accompanying money saving of fuel appeals to a few. The appeal to health is perhaps the most potent, and it is for this reason that this matter, though clearly an engineering affair, is so often placed in the department of public health for administration. In general, the attempt to show a direct relation between smoke and ill health has been disappointing to those demanding rigid demonstration. This has resulted not so much in throwing doubt on the reality of such connection as in strengthening the belief that the matter is so complicated that the methods of proof have not as yet been adequate to cope with the difficulties of the problem. The health argument has been greatly strengthened of late by the newer ideas of the part which short rays of sunlight play in our well-being, and of the part depression of spirit plays in good health.

Before we have scientific proof of these things, it may be that another argument may prove to be the most potent. There has never been a time when the material well-being of the mass of humanity has increased so rapidly as in the last generation. For many things it is no longer required to show necessity, or even good reason, to justify a purchase. Instead, we simply justify our luxuries because it is fitting that we have them. It is the habit of the time and it pleases us to drive an auto where we used to walk. It is fast becoming a sufficient argument against a smoky atmosphere that we "just don't like it." The argument "just because" has always been one hard to beat. Logic, facts, mathematical demonstration, an appeal to reason, have all retired in defeat before some little woman whose only argument is "just because."

Our Standards Have Risen

It may well be that the rising plane of individual and community living may soon reach an elevation where the general sensitiveness to discomfort will demand cleaner surroundings and not require a mathematical demonstration of our discomfort. The campaign against noise would indicate something of the kind. Are we more sensitive to noise, knowing its uselessness, than we used to be? And with means to buy comfort, are we less disposed to stand discomfort? The feelings that accompany a higher plane of living and that are not dependent upon logic or demonstration must not be overlooked. They may well be expressed by the old argument "just because."

It can hardly be said that we have attained a high de-

gree of success in our smoke abatement efforts. Our successes are qualified. Before we have attained general success in abating black smoke, the standard of our desire has risen, so that now we object to the dust of white ash and pearl-grey coke, although recently sterilized in a white-hot furnace. Compared to the dust of our cities when horse manure littered our streets, the present dust from our chimneys is a refined product, but there is no doubt about its being a nuisance according to our newly acquired standards. Black smoke and dust and cinders we can see, and we are annoyed by them, but now our standard demands the elimination of even unseen gases that come from the sulphur of burning coal. While we cannot see these gases, we do see their effect in corrosion of metals, in deterioration of stone, discoloration of paint, and death of vegetation. And so we can expect the standard of our desire to continually outstrip our means of attaining it. This should not be a matter of discouragement, but should convince us that we had best get busy and support a real effort to gain control of the situation by rational engineering methods.

How Can We Get and Pay for the Needed Engineering Service?

There is an awkward period in smoke abatement matters when the small city outgrows its village habiliments and really needs the full dress of the larger city. The small city is almost proud of the smoke of its industries. When it gets to be too much of a good thing, an ordinance is passed making the emission of dense black smoke a finable offense. The administration of the law is found to be difficult, and it soon becomes evident that merely passing a punitive law is a poor way of dealing with the matter. Engineering ability is needed to guide smoky chimneys into the way of cleanliness. But the city can neither find nor pay for the adequate service needed. To administer a punitive law is cheap, while to install the cheapest effective engineering service is so much more expensive that the town must grow up before it can afford the really needed service. This is the awkward period, and I know of no satisfactory solution of the problem. At such a time there is not enough of the strictly engineering work of a high order to keep a good man busy or to justify giving him the living he deserves and can win in other fields of effort.

There ought to be some way whereby the needs and funds of several moderate-sized cities could be pooled in order to support a really able smoke abatement crew who could apply the newer methods of leadership to the problem. Their part-time service in each community might supplement the continued effort of local help to carry on. Most of the inquiries for help come from these in-between cities which find themselves dissatisfied with the results of the old, but too small to afford the mechanism of the new. Capable men are hard to find to fill this need, because the work has not paid enough to be attractive.

Since the problem is largely an educational one, is it possible that a solution might be found by calling on the university engineering department in each state to work out a service plan, the overhead to be paid by the state while the expense of operation is borne, according to the service rendered, by the several municipalities served?

The Coming of Age of Our Cities

(An Editorial from Vol. I, No. 1 of THE AMERICAN CITY)

AMERICAN cities are awakening to self-consciousness and to a sense of their larger responsibilities. Hitherto they have been distinguished equally for the marvelous rapidity of their growth, for the untiring energy and vigor of their builders, and for the wanton lavishness with which they have expended, often squandered, their resources. They have shown on a grand scale the vices and the virtues of youth—ignorance and irresponsibility, courage and superb faith in their destinies. They have mistaken gaudiness for beauty, bigness for greatness. They have lavished millions on luxuries, but grudged the dollars for decency.

And now these big children of Uncle Sam are beginning to realize something of the seriousness of life. They have borrowed nearly or quite to their debt limits, and it is being borne in upon them that economy is a virtue that is worth cultivating. They are learning that there is a direct relation between crime and crowding, and that it is cheaper to help men to live decently in freedom than to force them to live idly in jail. They have found that congestion breeds consumption, and that parks are better investments than potter's fields. It has been shown that if we give boys and girls no place for whole-hearted play we need not be surprised when some of them grow up into hoodlums and prostitutes. It has dawned upon us that dirt and smoke and noise are no more necessary or decent in a city than in our homes; that beauty is not necessarily more costly than ugliness; and that it pays to look ahead of present needs. The American city is outgrowing its irresponsible childishness and is coming of age.

You Cannot Have Forests by the Mere Act of Throwing a Switch

By CHARLES LATHROP PACK
President, American Tree Association

IN the plans of the American municipality of tomorrow we shall find the town forest. This will be nearby where all can reach it. The town forest will be considered a great asset from several viewpoints—health, recreation, occupation, education. Many New England towns have long had town forests in operation. Before them, European municipalities have had town forests working for hundreds of years.

We live in what might be termed the switch-button age. We snap a switch for light, heat or cold, for ice or tunes from the air. Into the cost of all these things enters the cost of wood—that cornerstone of all industry. But we cannot have trees by throwing a switch. Living conditions are vastly different from what they were when we were all producers instead of nearly all consumers. Then the products of the soil were used at first hand because we nearly all lived at the point of consumption, on the soil itself.

There is a crop which the forest helps produce concerning which too few people ever think. That crop is water. Municipalities are spending millions and going far to find water for the taxpayer, who must foot the bills. We turn the faucet for the water, but give little thought to where it comes from. We read in history of treks of tribes in search of grass; long journeys in search of new pastures and water. What a commentary on our vaunted civilization if some day those who follow should be forced into a migration for water because those before them had turned this great country into a desert by denuding the land of trees. I hear someone say, "A dream," but look at China and the river they call the "yellow peril"; look at some other Asiatic countries.

MATHEMATICS OF OUR PREDICAMENT

It is not difficult to state America's forest problem.

Briefly and simply, we are using up our forests nearly five times as fast as nature is replacing them. To continue is to make us a nation of timber paupers.

Yet foresters tell us there is no need for suffering a timber famine, since under forestry methods we could grow even more than we use.

Our Economic Basis

Not only the municipalities, but all America, must become forestry-minded if her civilization is to go on. In forests lies our economic salvation. With the passing of our forests, whose products keep the wheels of industry turning, would come the passing of our entire economic scheme. There is no article of commerce into which the cost of forest product does not enter. We have heard a great deal about a trade expansion program. Any such program means an increased call upon our forest resources. Let us take stock. We are cutting our forests about four and one-half times faster than we are renewing them.

The world cuts about 56 million cubic feet of wood each year. Of this, a little less than half is of the size and quality that make it suitable for sawing lumber—the lumber used for building and for general construction. The rest—more than half—is small, inferior material cut chiefly for firewood. North America produces half of the wood cut in the world, and the conifers or softwoods supply about three-fourths of the sawing timber. It is the conifers whose perpetuation is essential so that the world may continue to be kept in timber. It is estimated that about 38 billion cubic feet is grown yearly. This is the figure to balance against a cut of 56 billion cubic feet when plans for the future are being made.

In the United States about one-sixth of our original forest land now bears virgin timber. In three centuries our forests have retreated westward and are now so distant from the centers of demand that today we pay 250 millions of dollars as our yearly freight bill to transport wood from the far-off forest to the lumber yard. As the number of people increases in the world, there will be a tendency for forested areas to further decrease to make more open land for food crops.

Preserve and Increase Our Forest Resources

The center of the greatest forest resources are on one side of the continent and the great industries far to the other side. What army could last a week 2,000 miles from the base of supplies? Business must look to the future; get out of this age of forest destruction and begin putting idle land to work on a wholesale scale. Those interested in the future of the American municipality will indorse wholeheartedly the work of educating the people to the importance of putting our 120 million acres of idle land

to work growing forests; the importance of keeping fire out of what we have left. The city and the country are interdependent and one cannot exist without the other.

Perhaps the city dweller pays too little attention to the value of trees and what they mean as a municipal asset. In New Jersey 100 towns and cities have manifested recognition of the worth of trees by creating shade tree commissions. Every community in Massachusetts is safeguarding its trees through an appointed guardian, vested with adequate power. Other states and individual cities are giving increasing attention to undertakings of the same nature and are making increasingly liberal expenditures to preserve existing trees and provide new ones to meet recognized needs. In the face of this, it is safe to assume that the practical American spirit will insist that, if the municipality spends public funds for planting and protecting its trees, every precaution shall be taken to prevent private agencies or individuals from causing damage which would injure the wood and destroy the fruits of the labor and money expended for the conservation of shade and the beautification of the community.

Celebrate by Planting Trees

A great impetus is given municipal and town forest planting by the plan for celebrating the 200th anniversary of the birth of George Washington in 1932. The American Tree Association has been delegated to direct for the George Washington Bi-Centennial Commission all the tree-planting plans. These should be made at once in order that every community may take part in this phase of the celebration. Those directing the plans should write to the American Tree Association immediately.

Shade trees have a value which may be translated into dollars and cents. In no other investment may individual or community achieve manifold profits such as those accruing from tree planting. Along with the dividends in beauty and comfort must be reckoned the cash value of each tree successfully planted and grown.

The Value of Shade Trees

Strikingly illustrative of the dollar-and-cent value of shade trees is the definite appraisal placed on them by city authorities. Springfield, Mass., may be cited as an example. Figures show that Springfield has more trees in proportion to population than any other American city, and the municipal government places an appraisal value of $100 on each tree. With a total of 25,000 trees in the city, this gives an appraised value of $2,500,000 to be counted as an added asset of the community. Ann Arbor, Mich., uses a similar method of computation and reckons the value of its 8,000 trees at $800,000. In reaching these figures the city officials follow the formula worked out by Prof. Filibert Roth, one of the foremost of American foresters, who formulated the first basis for shade tree valuation in this country.

In undertaking to set a standard for tree values, consideration must be given to many factors. A tree may be of value only for its lumber, or for its shade, or it may be as priceless as Hartford's Charter Oak or the world famous Cambridge Elm. With much depending on location and individual beauty, it is impossible to approach shade tree values without the law of averages. The more the city dweller comes to appreciate the value of trees, the more he becomes interested in their tremendous part in the economic scheme in which he lives and makes his living.

We are just entering the age of man-made forests, and man must hurry with the job, because he has used the forests too long with but little effort at replacement. A hole in a city pavement is soon impaired. A break in a water-main is fixed at once. Why not the same program with our forests! A forest crop every year from forests scientifically managed? Our economic safety depends upon such a program.

COUNTY PARKS ARE AIDING REFORESTATION

The bit of beauty here illustrated is in Glen Brook Park,—a part of the Union County, N. J. system. It is typical of the rapidly increasing county properties the country over. Here individually effective trees enhance the landscaped public play areas which have a setting of dense forest

The Newspaper as a City Builder

By G. B. DEALEY
President, *The Dallas News* and *The Dallas Journal*

THE role of the modern newspaper as a constructive factor in municipal progress depends to a great extent, if not wholly, upon the will of its publishers to make it more than a mere commercial enterprise, and upon the character that the newspaper has been enabled to develop during its existence in the community. Some newspapers may perform the functions of civic evangels with better success than others, just as some bankers or some lawyers, or some men in commerce and in industry, may by attained and recognized leadership wield a larger influence on the destinies of their cities than other men equally prominent in the public eye.

For reasons of modesty I should very much dislike to discuss the part played by *The Dallas News* and its associated publications in the upbuilding of Dallas, did I not believe that what has been done in Dallas can be done with equal facility in any other city whose publishers, or one among them, accepts the responsibility of the newspaper as a personal responsibility, one not wholly associated with the counting-room.

Whatever influence *The Dallas News* has had in the creation of a metropolitan city in the Southwest where forty-five years ago it found a country town, is attributable to its rich heritage from the institution out of which it sprang, *The Galveston News* (dating back to 1842), which played in the earlier years of the development of Texas a part somewhat like that the Dallas paper has essayed in its own city and throughout the state and the Southwest.

This influence has been the influence of the men who made the newspaper, for the paper has been but the medium for the expression of their personalities and their ambitions for their state and for their city. As the paper has grown, so have they grown, and so has the city grown, in an interdependent spirit of faith and confidence, of friendliness and of good-will. This has afforded the basis for the civic vision that has through the years been transmuted into the reality of accomplishment, not singly by the newspaper, nor by an individual, but by an enlightened public will. This will was strengthened through education as to what was best for the community and its people, and a wide dissemination of knowledge of what could be done to make of Dallas a better place in which to live.

The Newspaper's Opportunity and Duty

It is in this role of education, I believe, that the newspaper has its opportunity for public service, and its greatest opportunity for profit for itself. It is the duty of the newspaper to publish the news. That is a fundamental precept of journalism. This dictum may be given its broader application, with a serious study of the question of what is news. The management of *The Dallas News* has believed that news is to be found in everything that concerns the popular welfare; that news is not confined alone to the statement of facts after they have become facts, but also in a logical deduction anl presentation of what may become facts of direct interest to its readers; a forecast of the penalties to flow from civic slothfulness, and a contrasting picture of the benefits to accrue from civic progress and public-spiritedness.

Moved by this conception of news and of the duty of a newspaper, *The Dallas News* for most of its lifetime has sought to keep constantly before the people of the city and the state the possibilities of their future communal greatness.

When *The News* was established here in 1885, Dallas was in process of emulating Topsy. It was "just growing," as it had "just grown" from a single cabin on the banks of the Trinity in 1841 to the young but uncouth city of nearly a half-century later. Gradually, as it attained a foothold and prestige sufficient to make its efforts felt, the paper assumed a leadership in the direction of this growth. These initial efforts were not comprehensive, not the result of definite plan, but an evolution in the relationship between the paper and its public.

Civic Improvement and City Planning

But progress was made. The city grew, and *The News* grew with it. Espousing all of the things that seemed to be for general betterment, the paper fostered the organization in 1899 of the Cleaner Dallas League, whose objectives are amply indicated by its name. This group attained some success in making the town a cleaner and hence a better place in which to live, but soon outgrew its sphere, and was supplanted in 1902 by the Civic Improvement League, this again sponsored by *The News*. This organization found a field for useful work, and carried on with some success. But Dallas still was "just growing," and needed some definite plan.

In February, 1909, the writer, who had given much study to the whole question of city building and the potentialities of the growth of Dallas, read before a local club a paper on "Civic Responsibility." In this was presented the idea, then new in Dallas at least, that not only should the growing community have a city plan, but that this plan should comprehend what we now know as zoning. The thought fell upon fruitful soil, and in January of 1910, after a campaign of continuous publicity, the Cham-

ber of Commerce, itself an outgrowth of earlier organizations less vital in aspiration, agreed to take up the movement for a plan for Dallas. George E. Kessler came here in May of the same year, and was retained to prepare the groundwork for the Dallas that is and that will be. These few sentences summarize a great achievement, one attained only after heartbreaking difficulties. Few persons knew anything of city planning, and most of these satirically referred to it as merely "a city beautiful." In the years since, they have learned differently. City planning now is a Dallas institution; its results manifest to every citizen.

The Greatest Accomplishment in the City's History

The Dallas city plan is perhaps the greatest accomplishment in the city's history, for from it have come other elements of greatness. Through it the city has secured unified railway terminals, a union passenger station, and the removal of trunk-line tracks from its downtown district. It has enacted zoning legislation, has secured parks and parkways, playgrounds, water-supplies, traffic arteries, and numberless other conveniences unheard of before there was a plan. The tortuous Trinity River, which meandered through the heart of the city, often overflowing its banks, has been made to flow in a straight course by means of gigantic levees, over which five new bridges connect the two banks. As a result, many hundreds of acres of land are being developed into a splendid, modern industrial district where formerly swamps and breeding-holes for mosquitoes abounded. Since 1910 nearly $100,000,000 has been expended on city planning and related projects; and there remains for expenditure now some $15,000,000 of public moneys for the completion of elements of the vision that Mr. Kessler during his lifetime, and others since, have reduced to understandable lines on engineering drafts.

The News has not been content with city planning in its physical aspects. It has sought and still seeks an improvement in the form of usefulness of the city's government, and has led the fight for city management, decision on adoption of which is likely to be made by the voters before the end of 1930. It has sponsored artistic and cultural developments and primary and higher education. It has aided in every way possible in the expansion of commerce and industry, in the provision of transportation, transit and traffic facilities.

It has been largely responsible for the organization and the functioning of a citizens' group known as the Kessler Plan Association, for the continuous promotion of city planning. It has sent its staff men to other cities to keep its own people informed on civic progress. And it has lent its aid to the passage of laws by the State Legislature to facilitate planning in other sections, to legalize zoning, and to inculcate throughout Texas the ideal of constructive and planned growth. Space does not permit of enumeration of some of the movements in which *The News* is proud to have had a share. They are sufficient to bring a feeling to its editors and to myself as its president and publisher, identified personally with most of them, of gratification that ours has been the opportunity, and that the results show that it has not been wholly wasted.

Defining Objectives—and Believing in Them

In conclusion, I would make this suggestion: It is not enough for a newspaper to want to serve its public as a civic leader. The men behind the paper must believe in what they preach to their readers. They must define their own objectives, and sell themselves on their desirability before they can sell them to their readers. *The News* has believed in the things it has sponsored. It has, fortunately, enjoyed that measure of public confidence which has made others believe with it. Without that belief, and a faith that was consonant with it, little or nothing could have been achieved.

THE AMERICAN CITY is to be congratulated upon its own part in civic progress in America. Its columns have been a source of inspiration and of information to *The News* and the men who have labored to make Dallas what it is, and what they believe it will be. There remains much to be done. In Dallas *The News* is hopefully expectant of greater things; it is sure that for all of this great country there is still to be born a compelling civic-mindedness that will give us world leadership in urban living. In that THE AMERICAN CITY will, I know, have its great part, finding its reward in the record and knowledge of a public service well rendered. If in Dallas we have done that, we ought to be splendidly content.

"BEFORE AND AFTER" VIEWS OF PACIFIC AVENUE, DALLAS, TEXAS
The illustration at the left shows the noisy, dusty, railroad right-of-way street as it was until 1923
The view at the right shows the same street as it appears in 1930—one of the fine thoroughfares of the city

The Rise and Spread of the City Manager Plan of Local Government

By RICHARD S. CHILDS
President, National Municipal League

IN the twenty-one years since THE AMERICAN CITY was founded, we have seen the rise and spread of the city manager form of municipal government and the recognition of it among political scientists as the final phase of our fifty-year-old struggle to make American democracy take a workable form in modern cities.*

Will the City Manager Plan Become the Standard Form?

If there is a better form than the city manager plan, the current generation of students of such subjects does not know what it is and does not ask for anything better. There is justification for believing that there can be final solutions of such problems; the identical form of organization in private corporations has remained the same for generations and there is no restless tinkering with it; the states that adopt the Massachusetts form of ballot cease to agitate for further alteration; such problems when finally solved rightly, are forgotten. So we may reasonably hope that these twenty-one years may be seen by future historians as the ones in which America found the correct form of city government and proved its correctness by experience in four hundred cities and villages. If this be so, the next twenty-one years will be a story of the spread of the plan to perhaps a thousand or two thousand towns and its acceptance throughout the United States as the standard form. The efforts of progressive minds may then direct themselves to the *purposes* of government and cease their concern about the mechanics of the instrument they are using.

In 1909 the strong mayor plan, first launched in Brooklyn and defended by Seth Low and others in the 'nineties, was the favorite plan, the earlier weak mayor plan was still widely used and a few of the still earlier forms with a bi-cameral council still survived. There had arisen a new form, the commission plan, and in the ensuing years of eager progressivism this plan spread to some three hundred municipalities on the basis of its early successes in Galveston and Des Moines. It had its good features—a short ballot, a non-partisan ballot, and a certain simplicity and swiftness which contrasted favorably with the more complex procedures of the previous forms. Reformers and political scientists, however, took it with salt. They saw its five-headed administration and the log-rolling situation created when five men, acting as department heads, sat in a council to apportion revenues among themselves.

The New Model Charter

But the commission plan movement had broken the caked mass of tradition, and a newer and equally radical form could get a welcome on its merits. The group of civic strategists in the National Municipal League were prompt and confident in accepting the city manager plan when the Short Ballot organization brought it out as the Lockport Plan, and they presently abandoned their Model Charter, based on the strong mayor principle which represented the boldest simplification of municipal government that could have been hopefully advanced up to that time, and wrote a new Model Charter on the city manager principle. In the last fifteen years there has been no deviation of principle from the clean and straightforward structure of government then set forth. The original form has become the standard and no efforts are in sight to monkey with it.

From twenty-five to forty-five cities adopt the plan in a complete and satisfactory version every year. About once in two years some city reverts to an older form for reasons that seem to be always local and even personal.

The early triumphs of the plan in Dayton under the brilliant four-year administration of H. M. Waite have been repeated in numerous cities and have "stayed put" in Dayton itself, where for seventeen years the administration has remained on a merit basis untouched by poli-

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* EDITORIAL NOTE.—Turning back to Volume II of THE AMERICAN CITY—page 81, February, 1910—it revives an old-time thrill, touched now with amusement, to read that "Dr. Eliot of Harvard has aroused considerable curiosity recently by making extended reference to what he called the 'principle of the short ballot.' . . . . For the information of our readers who received only the newspapers' fragmentary reports of Dr. Eliot's statement, it may be well to explain that the 'short ballot' is the name given to a new movement for the simplification of politics." The same article reports that "Dr. Woodrow Wilson of Princeton is at the head of the short ballot movement, and an association known as 'The Short Ballot Organization' was formally launched at a banquet and conference. . . . . on January 21, Dr. Wilson explaining its plan and scope." The secretary of the preliminary organization is the author of this Twenty-first Anniversary article, who was announced in 1910 as "prepared to answer inquiries."

In the same issue appeared a brief review of an article in the *Municipal Journal and Engineer* for December 29, 1909, telling how "the Council of Staunton, Va., a city of about 12,000, thoroughly dissatisfied with the existing government, where everybody's business was nobody's business, hit upon the expedient of appointing a salaried officer whose entire time should be devoted to the city's affairs, and in a broad and simple ordinance created the office of General Manager." The article was written by John Crosby, President of the Common Council of Staunton, who gave due credit for the economy and efficiency attained by running the city "as a strictly business corporation would be run," to Charles E. Ashburner, "who is, as should be the case in small cities, a practical engineer."

Leaping forward sixteen months, we find on page 285 of Volume IV of THE AMERICAN CITY—June, 1911—Mr. Childs' article on "The Lockport Proposal—A City That Wants to Improve the 'Commission Plan.'" The gist of this improved plan was the short ballot—"only five to elect and all of them important and conspicuous"; and "the first and broadest improvement over the Des Moines plan" was "the separation of the representative and administrative functions by the creation of an appointive chief executive called the city manager. The author's keen analysis of this and the other improvements proposed, leads directly into his present article with its backward sweep and its forward look into the possible pioneering of dependable government.

tics and unthreatened at elections. The old saying that "a reform administration is never re-elected" is all but reversed in the experienced of the city manager towns.

The Lifetime Career of the City Manager

In these twenty-one years the friendly publicity which THE AMERICAN CITY has given to many items of news about the plan has been rewarded by the development of a new class of subscribers, the city managers. They constitute a distinct little profession now, holding annual three-day conventions, publishing their own *Public Management* magazine and remaining keenly receptive to ideas for advancement of administrative technique. They are the first municipal chief executives who have had any reason to be interested in learning their jobs and becoming experts, for they can hopefully consider this profession as a lifetime career, inasmuch as they are, like school superintendents, able to move from city to city, advancing to larger opportunities and larger salaries. Over a hundred of these managers are in their second city, several are in their third or fourth, and one is in his fifth. It would have been a bold bit of romancing if THE AMERICAN CITY had ventured to predict all this twenty-one years ago!

In this period the commission plan has been halted and superseded. Few cities have adopted it in the last ten years, many have dropped it for either the older mayor-and-council plan or the newer city manager plan. In the history of municipal government the commission plan has become already a useful but transitory incident.

"P. R."—Efficient, Though Not Popular

In this period proportional representation has had a trial, thanks to the pertinacity of C. G. Hoag, of Haverford, Pa. "P.R." has had a hard time. It presupposes the existence of conscious parties and groups and secures fairness of representation among them in the city council. An American city may have long periods in which there are in the electorate no deep divisions such as P.R. undertakes to provide representation for, and the people come to regard P.R. as a mathematical contrivance for counting votes, capable of being discarded as involving no principle. Nevertheless it has worked with remarkable smoothness and has done all that was claimed it would do except to ingratiate itself securely among its beneficiaries.

What New Governmental Service?

The one disappointment to me about this record of progress is that the new city manager governments with their steady efficiency have not been made use of to advance confidently into new and more difficult realms of common service. They have only taken on the usual duties and averaged better in doing them. One Texas city manager, to be sure, has taken on the whole function of charitable relief, but such imagination is exceptional. They are doing no pioneering; they just save taxes and lower death-rates and keep the grafters out. Of course there has been a war and a reaction against progressivism, and a hard-boiled disclination to embark in new adventure. Perhaps it would still be premature for the voters to trust these new governments with new burdens like running bus lines or delivering milk. But I share the disappointment which the Socialists of Dayton expressed when the new government declined to take over the street-car lines.

Given dependable government, what are we going to do with it? Gild the dome of City Hall? Or shall we in the next twenty-one years use it to

". . . bless the bleak Atlantic shore
And in the west bid Athens rise once more"?

Statistics of City Manager Cities and Managers

FROM one city having a city manager in 1908 (Staunton, Va.), the list of cities operating under the council-manager form of government has increased to 402 in 1930. In 1915 there were only 53 cities; in 1920, 170; and 330 in 1925. The manager plan operates either by ordinance or, preferably, by charter; of the 340 cities that have adopted the plan by charter, only nine have abandoned their charters.

Thirty-five states, five Canadian provinces and Cork, Ireland, are represented in the 1930 total of 402 cities. Forty-seven cities each with a population exceeding 50,000 are included; fourteen of the forty-seven have populations of over 100,000. The thirteen states which have no recognized council-manager cities are: Alabama, Idaho, Indiana, Kentucky, Louisiana, Maryland, Mississippi, Nevada, New Hampshire, North Dakota, Rhode Island, Washington and Wyoming. Michigan, with 42, leads all the other states in the number of cities operating under the manager plan; Florida has 39, Texas 33, California 31, Oklahoma 28, and Virginia 26. Ohio adds 20, Pennsylvania 18, North Carolina 15, Kansas 14, Georgia 13, Iowa 12, West Virginia 10, Quebec 9, New York 8, Vermont and Wisconsin each 7, Massachusetts and Oregon 6 each, Colorado, Illinois, Minnesota and Tennessee each 5, with 4 apiece for Maine, New Jersey, New Mexico and South Carolina, 3 each for Connecticut and Missouri, and 2 in Montana, South Dakota, Manitoba and Ontario. Arizona, Arkansas, Delaware, Nebraska, Utah, Alberta, New Brunswick and Ireland contribute one city each.

Before a city is placed on the "official list" compiled by the International City Managers' Association, the charter or ordinance establishing the plan must provide that the city manager be responsible to the council for the administrative affairs and have broad appointment and removal powers over administrative officers. Several cities erroneously placed on the official list in past years have been removed. One hundred and seven cities not qualifying for the Association's rating nevertheless have an official called City Manager.*

The highest salary received by a city manager is $25,000; the lowest reported to the City Managers' Association is $1,200. The table given herewith indicates the range of salaries of the 382 managers for whom salary figures were available, as of January 1, 1930.

Four years and eight months, including all cities served, represents the average length of service of the 398 managers for whom data are available. This is an increase of one year and four months as compared with the average length of service of managers holding office on January 1, 1926. One hundred and seven or 27 per cent of the 398 have served less than two years; 248 or 61.9 per cent, three years or more; 150 or 37.7 per cent, five years or more; and 34 or 9.5 per cent have served as city managers over ten years. Two managers have completed fifteen years of service.

$15,000 and over	5
12,500-$15,000	2
10,000- 12,500	16
7,500- 10,000	32
6,000- 7,500	36
5,000- 6,000	50
4,000- 5,000	82
3,000- 4,000	81
2,000- 3,000	55
1,000- 2,000	23
	382

Seventy of the 402 city managers holding office on January 1, 1930, had served two or more cities. The following table shows the number of cities served:

Cities	Managers
One city	331
Two cities	53
Three cities	12
Four cities	2
Five cities	2
Six cities	2
	402

* See The Municipal Index for 1930, pages 823 and 829, for both lists, the names of the city managers and their salaries.

Municipal Finance, Also, Is Now Attaining Its Majority

By A. E. BUCK
National Institute of Public Administration

PERHAPS greater advance has been made in municipal finance during the last twenty-one years than in any other important phase of city administration. If we turn back to 1909, we find that the financial structure of city government was just beginning to take definite shape. Only a few cities, principally those with the commission form of government, had unified their financial functions by setting them up as a major department of the city administration. The development of the integrated department of finance, now generally recognized as being the most advanced type of fiscal organization, was yet to be realized.

Municipal budgeting was still in its swaddling clothes. The New York Bureau of Municipal Research, parent of practical budgeting in this country, had been established only about three years. General accounting in city governments was just emerging from the single-entry, cash-basis stage, with its bound books and pen-and-ink entries. Cost accounting was practically unknown in connection with the work of city governments. Auditing was of the most perfunctory type, having to do merely with purchases and payments as evidenced by bills or statements and not with performances or operations growing out of the normal processes of city administration. Treasury management consisted largely of taking whatever cash came in on account of taxes or other revenues and paying all bills submitted for services and commodities and otherwise, so long as the cash held out. No attempt was made to accrue the revenues of the city government, to see that the accruals were all collected at the proper time, to maintain a working balance in the treasury, and to anticipate expenditure requirements throughout the fiscal year.

Personnel management or supervision, a term commonly used today, was unknown, at least as applied to city government. Centralized purchasing for cities was still a theory, not an actuality. The assessment of property for taxation along scientific lines was just emerging from the old rule-of-thumb methods that had been in vogue for generations. Most of the assessment methods and technique now in use were yet to be developed. Cities were borrowing money to carry on their business, though not so extensively as today. However, they gave little or no attention to the purpose for which they borrowed money, to the kind or term of the bonds which they issued, or to the prospective resources of the government to pay the bonds when they came due.

This, in brief, is a picture of the condition of municipal finance in the United States at the time THE AMERICAN CITY was born, in 1909.

Now let us see what progress we have made—at least, what we believe at this time to be progress.

The Department of Finance

From the standpoint of financial administration, the development of the department of finance during the past two decades appears to be quite significant. Such a department provides the kind of organization required in executing the financial plan of the government; that is, a closely integrated structure under the supervision of a single officer who is directly responsible to the city executive or chief administrator. The work of the department of finance is generally organized under certain bureaus, namely, accounts, treasury, taxation, and purchasing. These bureaus are directed by single officers, usually selected by the departmental head. The bureau of accounts keeps the general books of the city government, exercises current or pre-auditing control over all income and outgo, compiles the financial data for the preparation of the budget, supplies the accounting information for the execution of the budget, and prepares all general financial statements. This bureau may set up subsidiary accounts, including cost accounts, for departmental purposes. The treasury bureau collects, keeps, and pays out the funds of the city government, all payments being made upon the authorization of the bureau of accounts. The bureau of taxation is responsible for the assessment of property, the taxing of business, and the determination of benefits and privileges, in so far as authority for these things is delegated to the city government. The bureau of purchasing buys the supplies, materials, equipment, and certain contractual services for the various using agencies of the city government. The department of finance may also include a budget bureau charged with the preparation of the budget, the scrutiny and approval of administrative work programs and allotments, and the investigation of departmental and institutional services. Finally, it may include a bureau of personnel which supervises city employment, classifies positions, and standardizes salaries.

Budgeting

Budgeting, undoubtedly one of the important and lasting improvements in the financial administration of cities, is almost entirely the outgrowth of the period since the establishment of THE AMERICAN CITY. Perhaps the greatest progress in budgeting has been made during the last five years. Of the three essential phases of budgeting—formulation, adoption, and execution—we have made the most advance in the first two; in fact, they have reached

something of a satisfactory status in most city governments. But this cannot yet be said of the third phase, namely, the execution, although enough has already been accomplished in a few cities to indicate pretty clearly what the future trend should be. It now appears that the work program, which is simply current planning by the administrative officers after the appropriations have been authorized, is an essential element. Supporting this program are the monthly or quarterly allotments through which control is established over the rate of expenditure, so that the entire appropriations may not be spent before the fiscal year is concluded. A schedule of anticipated income of the city government for the several months of the fiscal year is also required, thus making it possible by a comparison with the expenditure allotments to maintain a working balance at all times between income and outgo.

New Methods of Accounting and Auditing

Municipal accounting has made rapid strides in twenty years. Machine systems on an accrual basis are now found in several cities. The old long-hand, cash-basis methods of accounting are growing daily more and more obsolete. They are being gradually displaced by machine methods, requiring loose-leaf ledgers which are posted mechanically, sometimes both billing and posting being done in the same operation. Expenditure analyses and cost figures are now secured with great speed and accuracy by the use of punch cards, the results being accumulated by sorting machines and tabulators. While general accounting is fairly well developed in a majority of cities, cost accounting has received very little attention except in a mere handful of cities. The wide application of cost accounting to the administrative operations of city government appears to be the next important task in this field.

Until quite recently much confusion has existed on the subject of municipal auditing. The two distinct types of auditing, namely, administrative or pre-auditing, and post-auditing, were not generally recognized. Some cities maintained only one type of auditing; others maintained an unsatisfactory combination of both types. In fact, the auditing was so poorly done in many cities that the state government felt constrained to take a hand in it. Out of this confusion there has gradually developed what now appears to be a satisfactory arrangement for municipal auditing. The pre-auditing is done by the bureau of accounts in the department of finance. It is of an administrative character and precedes the payment of all claims by the city treasury. The post-auditing is done preferably by an agent of the city council, although it may be done by an elective auditor or by representatives of the state government. Where the city council is responsible for the post-auditing, it may select an auditor who is a permanent officer with a staff, or it may hire certified public accountants to make the post-audit periodically. Either method is satisfactory, the latter being perhaps less expensive. Post-auditing, when properly done, constitutes an independent check on the operations of the city administration.

Treasury Efficiency

Effective treasury management is now in the process of being developed in a number of cities. Important elements of it are the accrual of municipal revenues for the fiscal year, the prompt and full collection of such revenues, and the concentration of all receipts in the treasury so that they may be immediately available for use. The elimination of special expendable funds, merging the city's receipts as far as possible in a single general fund, is a valuable aid to treasury management. It facilitates the maintenance of a working balance throughout the fiscal year.

Personnel Management

Administrative control over the purchase and use of personal services and of the various commodities and equipment used by the city government is vitally related to municipal finance. Many city governments have had so-called civil service for a long time, but it has generally been of a more or less static character. Only recently has an appreciation developed of the intimate relationship existing between personnel and day-to-day administration. As a result, some experiments are now being made in the direction of establishing personnel management under an officer responsible to the city's executive or chief administrator. These experiments hold considerable promise.

Centralized Purchasing

With respect to the purchase of commodities, equipment, and so forth, a system has been devised during the last two decades and is now widely accepted by cities under which there is a centralization of responsibility. This system is commonly referred to as centralized purchasing. An officer, generally known as the purchasing agent and frequently at the head of a bureau of purchasing in the department of finance, is directly in charge of this work. He is accountable to the city's administrative head.

Assessment Practice

The present technique of assessing real estate has largely developed within the last twenty years. During this period it has become an established practice to make the valuation of land separate from that of the buildings and other improvements on the land. It is also the practice to collect and compile in suitable form complete information on the location, dimensions, and general characteristics of each parcel of property. The information on location and dimensions is usually set up on so-called block and lot maps, accompanied by ownership lists arranged in geographical order. This information is generally supplemented by data on buildings, etc., placed on cards. The unit foot is now generally used in the valuation of land in cities. Its application is facilitated by the use of certain depth rules. The most common of these are the Somers and the Hoffman-Neill, named for the individuals who perfected them.

Bond Issues

Municipal bond issues are now regulated in a great many instances by state laws; the payment of interest and the amortization of bonds are often supervised by state officials. As to the kind of bonds issued, the trend seems to be distinctly away from the term bonds retired by sinking funds, so common a few years ago, and in the direction of serial bonds amortized through the annual budget. Some effort is now made to relate the term of the bonds to the life of the improvements financed by them. The latest device, and one which seems quite promising, is the long-time financial program. It is applied especially to the financing of municipal improvements. Such a program tends to stabilize the financial demands resulting principally from capital expenditures, thus obviating avoidable borrowings for improvements.

Trends in Ownership and Regulation of Public Utilities

By JOHN BAUER, Ph.D.

Director, American Public Utilities Bureau

PUBLIC ownership and regulation are two distinct modes of expressing and conserving the inherent social interest in public utilities. Both have to do with industries and services which have been distinguished from ordinary business as to their basic economic characteristics and their recognized legal status.

The utilities are intrinsically public businesses, partly because of the community aspect of their services, partly because of their special franchises and other extraordinary grants not conveyed to private industry, and partly because of their monopolistic character. Because of these characteristics, the public character of the utilities is not changed even if organization takes the form of the ordinary private corporation. Whether there is direct public ownership and operation, or so-called private ownership and operation, the public character of the business is the same, and the particular form of organization depends upon historical circumstances and upon special conditions of convenience and expediency.

Parallel Development

If there is public ownership and operation, then there is a direct and immediate public representation of public interest. But if there is private ownership and operation, then there must be public regulation to protect and promote the public interest. The two movements emerged together with the growth in social importance of the particular industries, and for the most part they have had a parallel development. By 1900 both had made their beginnings. In 1902, for example, there were 815 municipal electric plants in the country; but by 1917 there were 2,318—the movement expanded rapidly during that period. On the side of regulation, in 1898 came the famous case of *Smyth v. Ames,* in which the Supreme Court of the United States laid down the fundamental basis of rate-making—that a fair return must be allowed on the "fair value" of the properties used in the public service. In 1907 came the first public utility commissions, with the power and duty to fix rates, and they spread rapidly throughout the country, reaching by the time of the war almost every state of the Union.

The two movements had their impetus from the same conditions, and have been affected by substantially the same changes. They advanced rapidly after 1900 because of rapidly growing public interest in utilities, due to the progressive importance of the services and to the grave abuses which had developed in connection with franchises, service, rates and financial practices. This rapid advance continued up to the time of the war. Both were strongly supported by progressive political groups, and both gave promise of vigorous action and fruitful results for the public. To some extent, the two systems were competitive for the public good, and doubtless reacted on each other in stimulating zeal for public welfare. New municipal systems were rapidly established to the end of providing better service and lower rates, but, at the same time, the commissions were establishing better standards of service and were seeking to reduce rates to the lowest possible level consistent with fair treatment of the companies.

Then came the war, with its vast upheaval of social structures, and it affected gravely both movements in the utility field. It shifted public interest from both utility movements, as well as from other economic questions, and left them for the time as matters of small public concern. After the war came the period of general disregard of public affairs. This has marked the distinct weakening and growing ineffectiveness of regulation, and has witnessed the stoppage and backward swing of public ownership and operation. During the past few years, however, there has been a rather far-flung reawakening, and we seem to be returning to both regulation and public ownership as instruments of public policy—but this may be just a dream, instead of the dawn of a new social day!

Technological Factors

Besides the shift in public interest, there have been also technological and economic changes which have affected the movements of regulation and public ownership. As to technology, there has been steadily increasing economy in large-scale generating plants, with parallel improvements in distance transmission. These advances have rendered many small generating plants, particularly those using steam, largely obsolete, and have resulted increasingly in centering the generation of current in large stations. They have affected local private plants as well as local municipal plants. The former have been grouped more and more in larger operating units, while municipal plants have been purchased and incorporated within the expanding private systems. In many other instances, however, although the municipal generating plant has been abandoned, the distribution plant has been retained, depending for current upon central-station supply from private companies.

The sale of municipal plants has in all probability gone much further than is justified on technological and economic grounds. Probably in but few instances was there justification for the sale of distribution system, so far as economy of operation is concerned. The sales were made

partly because of high offers for the plant, and partly because of low public interest in the municipal undertaking. The high offers, in turn, have been based upon expectations of the purchasers to recoup through revaluations and the continuance of high rates. The companies, in other words, have relied upon the ineffectiveness of regulation to enable them to make good upon excessive prices paid for local properties, whether purchased from municipalities or private companies.[1]

Regulation has become ineffectual in part because of lessening of public interest, and partly because of court decisions; and, probably, the court decisions have been due largely to the low public interest. With the price upheaval during and after the war, the courts have insisted that in fixing rates the commissions must base them largely, if not exclusively, upon the reproduction cost of the properties. This practical shift of control from actual cost to reproduction costs has not only greatly increased the difficulties of regulation, but has enabled the private companies to make good on excessive purchase prices—and put a premium on insidious valuation practices and on a wide range of efforts to procure favorable action or inaction.

Renewed Interest in Regulation

With the resuscitation of public interest, there has been increasing criticism of regulation; movements have started to revise the existing systems, and to establish through legislation definite cost bases of rate control. The state of New York made a legislative survey during the past year, and the proposal of establishing a cost rate system promises to be the chief political issue in the forthcoming gubernatorial and legislative election.[2] Somewhat less comprehensive inquiries have been made in Massachusetts, Wisconsin, and other states. Whether a workable system can be established depends upon such vigorous leadership as promised by Governor Roosevelt of New York, and upon final court decisions passing upon the new system. And both contingencies depend largely upon the state of public opinion—whether it is satisfied with conditions of the past ten years, or whether it really demands an effective system of control. Perhaps one of the favorable factors is the intense and country-wide industrial depression, which will make questions of rates appear more important than during the past ten years.

Both Methods of Control to Continue

This movement for effective regulation is likely to spread as rapidly as the commission system a generation ago, especially if an important state like New York should set the pace. It will probably be attended by expansion of public ownership. The latter movement, so far as electricity is concerned, may take the direction of increasing municipal ownership of distribution systems, the development of state generating (or even transmission) systems, and, in few instances, Federal projects, such as Muscle Shoals and Boulder Dam. For the most part, however, the generation and transmission of power will probably remain in the hands of private companies, because no suitable form of public organization is available to meet prevailing conditions. Adequate public protection will therefore require definite standards of regulation. But the continuous effectiveness of such standards will depend also upon the availability of public ownership. The two forms of public protection have developed together, supplement each other, and are practically certain to advance together in the immediate future.

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[1] An excellent account of municipal ownership and operation in the electric industry is given by Dr. Ralph L. Dewey in *Public Utilities Fortnightly*, June 12, 1930, pp. 715-728. Dr. Dewey uses mostly U. S. Census figures, and gives an admirable interpretation of the changes. In 1902, there were 815 municipal establishments; 2,318 in 1917; 2,581 in 1922, and 2,198 in 1927. A more intensive survey tracing all municipal plants established since 1881 has been made by Herbert N. Dorau, published as a monograph by the Institute for Research in Land Economics and Public Utilities, Evanston, Ill.

[2] The report of the so-called "Revision Commission" has been published as a public document by the state of New York, including majority and minority report, and special report by counsel of the Commission. A comprehensive account of the New York situation, particularly of the valuation problem and constitutional questions involved, appears in the current (September) number of the *American Economic Review*, and was prepared by the present writer, who made a special valuation study for the Revision Commission.

When Cities Become Land Buyers

WHETHER to make public their plans for municipal improvements and then probably have to pay speculators' prices for the real estate involved, or to try to maintain secrecy with its attendant risks until everything can be made ready to begin work, is a dilemma confronting the planning commissions of many cities in the United States.

Discussion in the recent National Conference on City Planning in Denver brought out that where a planning commission makes public its plans as soon as they are formulated, property along affected streets sometimes loses in marketability and rental value for the time, and if after a year or two something necessitates a change in the plans, the property owner is left without compensation for the period of inactivity.

In other cases an announcement has the opposite effect. The market is enhanced. Speculative buyers come in to make a quick turnover to the city. They demand high prices, and either obtain them from the purchasing officials, or else in condemnation proceedings get judgments from over-generous juries for several times what the property ordinarily would cost a private purchaser.

Now, if planning boards and associations try, as some have, to circumvent this hoisting of land costs, they encounter other difficulties. A few commissions have formed their plans in private and withheld them while preparing to act. But in obtaining real estate options, only the greatest care, and sometimes not even that, will prevent leaking of the news. The larger newspapers frequently are taken into rather unwilling confidence, but meanwhile some small neighborhood paper may print a clue of what is happening, or worse, a hint may be passed by word of mouth among a few who will profit at the expense of property owners. Options cannot be taken by a planning board itself, and though sometimes they are gathered by some civic-spirited individual to be turned over to the municipality at cost, there may be insinuations of profit and favoritism to which business men are loath to expose themselves.

In Cleveland a promising method has been introduced. In acquiring land for public buildings, street openings or bridge approaches, the Chamber of Commerce or a community organization under a non-profit charter, cooperating with the planning officials, has taken options on key pieces of property at prices recommended by an appraisal committee of the Real Estate Board, and after passage of the bond issue has turned them over to the city at cost plus interest.

The success of this method will depend largely upon how well a large group can keep confidential information and upon how well the planning commission and its associates retain the confidence of the people. In view of the important and widespread benefits possible in economy of land purchase for civic developments, an effort of this type merits heartiest support on all sides.

—An editorial from the July 12 issue of *The Christian Science Monitor*.

Municipal Electric Plants: Their Past, Present and Future

By FREDERICK L. BIRD
Assistant Director, Municipal Administration Service
Former Secretary, Committee on Coal and Power

MUNICIPAL ownership of electric light and power plants in the United States has been developing as an interesting civic experiment for nearly fifty years. Although the production and distribution of electrical energy is predominantly in private hands, municipal projects have been sufficiently numerous and varied to make them a significant feature of this field of utility enterprise.

While the great majority of municipally owned lighting plants are in small centers of population where it was originally essential for the municipality to undertake the development, there are 44 municipal establishments in cities of 20,000 and over. These include the large cities of Los Angeles, Cleveland, Seattle, Jacksonville and Tacoma.

During the last decade, however, the revolutionary development which has been in progress in the light and power industry has had its effect upon public as well as private establishments. Thus municipal ownership of light and power is in a transitional stage, and the proponents of private ownership are emphatic in their opinion that local public plants will soon be institutions of the past.

It is quite true that the number of municipally owned establishments has decreased perceptibly during the past few years. A careful statistical analysis published recently by the Institute for Research in Land Economics and Public Utilities shows that, whereas there were 3,014 municipal plants in 1922, more than twice as many as when THE AMERICAN CITY began (1,416 in 1909), the number had decreased to 2,320 in 1927. This trend, however, has not applied exclusively to public plants. Over the same period the number of private plants has dropped from 3,774 to 2,137. At the present time there are more public than private plants in operation in the United States. It is significant, moreover, that with very few exceptions, the plants that have changed to private ownership during this five-year period have been in small towns and villages.

The reason for the decline in the number of public plants is not be attributed to inefficiency of public business. Obviously, if this were claimed to be so, the greater decline in the number of private plants could be said to indicate that private inefficiency is worse. The movement is merely a part of the concentration into great, interconnected generation and transmission systems which began with the private plants at an earlier date. The economic advantage of large generating systems over small generating units is the explanation for the sale of the great majority of those municipal plants that have been disposed of to private companies.

There have been, however, other contributing causes of a less justifiable nature. In some instances, cities have followed the short-sighted policy of selling their plants in order to use the proceeds for other municipal purposes. In many cases, excessive prices have been paid for municipal plants because the private companies have wished to eliminate municipal ownership, have been competing with rival systems for regional control, or have foreseen the opportunity to recoup their extravagant expenditures through laxity of state regulation. Under the present system of rate making, there is little hope that such transactions will result in the passing-

What Are the Prospects for Municipally Owned Electric Systems?

The author of the accompanying article, a close student of municipal electric utility undertakings, summarizes the future probabilities for municipal ownership of light and power as follows:

1. The larger plants will continue to operate on their present stable basis, their ability to generate energy economically enabling them to be independent of the large privately owned systems. Continued dissatisfaction with the domestic rate policies of the private companies will tend to increase their numbers.

2. Municipal plants in small villages will continue to pass into private hands unless a broad movement should develop for the creation of public power districts.

3. Towns of 1,000 population or more owning their lighting systems will in some instances find the installation of diesel plants the solution for their generation problem; but the great majority will stabilize their systems on the basis of purchase and distribution, such alternatives as diesel generation and the organization of power districts providing leverage for securing reasonable wholesale rates.

4. No marked increase in the number of municipally owned plants can be expected so long as the present legal limitations on the right to acquire utilities, to finance their acquisition and extension, and to cooperate with other municipalities are permitted to stand.

on of the benefits of large-scale production to the consumers.

Another important change in the status of municipally owned lighting systems has been the abandonment of small generating units in favor of the purchase and distribution of electricity. Prior to 1917, more than 75 per cent of the municipal establishments generated all or part of their energy. By 1927, this proportion had declined to 52 per cent. This policy of retaining their distribution systems is widespread in small towns which prefer the principle of municipal ownership but have found local generation of energy uneconomical since the development of large-scale generation and transmission. In some states, such as California and Massachusetts, the great majority of municipal plants abandoned the generation of electrical energy in earlier years and have continued successfully as distributing systems. In such instances, the policy of municipal distribution seems firmly established and the number of such systems is even tending to increase.

What, then, is the outlook for municipal light and power? It would be presumptuous, in view of the swiftness with which technological changes are taking place in the electrical industry, to endeavor to predict future developments with assurance. But certain possible trends may well be considered.

While in all probability a considerable number of small municipal plants will continue to disappear, there is little likelihood that municipal ownership will cease to be a significant factor in the light and power business. Rather is it probable that municipal ownership will become of increasing importance unless radical revision is made in the unsatisfactory principles of regulation and rate making under which the private companies are now benefiting at the expense of domestic consumers.

Larger Municipal Plants Not Affected

There is no tendency on the part of the larger communities, as has been pointed out, to give up their municipal systems. In fact, they have every reason to be satisfied with the present status. Without exception, they are enjoying rates well below those of similarly situated cities served under private auspices. Their plants are efficiently administered, and their foresighted policy of amortizing outstanding bonds from earnings is preparing the way for even more successful results in the future. Dr. Morris Llewellyn Cooke demonstrated in a recent study, "On the Cost of Distribution of Electricity to Domestic Consumers," that there is no justification in American cities for a lighting rate higher than 5 cents per kilowatt-hour. There is considerable significance in the fact, therefore, that with very few exceptions no private plant charges so low a rate, while no large public plant exceeds this figure. The following are pertinent illustrations: Seattle, 5 cents; Springfield, Ill., 4.8 cents; Los Angeles, Tacoma and Pasadena, 4.5 cents; Holyoke, Mass., and Jamestown, N. Y., 4 cents.

The effectiveness of the larger municipal generating plants has not been disturbed by the revolution in the power industry. A study of unit costs made in 1928 by a special committee of the National Association of Railway and Utilities Commissioners ascertained that modern steam-generating plants, such as would be used in supplying cities of 20,000 or over, could hold their own with the larger stations in so far as production costs are concerned. It is only in communities below this size that local steam generation has become disadvantageous.

What Course Will the Smaller Communities Follow?

For these smaller communities, there are three alternative prospects if they wish to continue in the lighting business. A considerable number of small cities have solved the problem by the installation of diesel engines. Where there is sufficient diversification in the type of service to produce a reasonably high load factor, this method of generation is proving very economical and satisfactory for small systems.

Where local generation is economically impracticable, there is the possibility of cooperative generation through the establishment of a single publicly owned generating station for the service of a group of towns and the intervening rural area. This plan has proved extremely practical in California, where two large districts have been operating hydro-electric systems successfully since 1923. Both rural and urban consumers are enjoying cheap electrical energy for all domestic uses at the average rate of 2.6 cents per kwh. for a consumption of 250 kwh. a month. Before the creation of public power districts becomes generally feasible, however, legal authorization will be necessary, and state legislatures should be persuaded to act.

For the great majority of small towns and cities, the immediate future offers the prospect of a combined system of private generation and public distribution. The trend is very definitely in this direction, with the possible alternative, in some areas, of state or federal generation.

The advantages of this compromise, provided the city is in a position to demand reasonable wholesale rates, are much greater than commonly supposed. The economic advantage of large generating systems over small generating units does not hold in the case of distribution. Not only can a small distribution system be operated at a cost comparing favorably with that of a large one, but municipal systems have very definite advantages over privately owned enterprises. Lower interest rates, lower administrative costs, the opportunity to use existing municipal facilities, and freedom from the necessity of paying dividends on inflated capitalization as well as from paying various and sundry managerial fees to holding companies more than offset the advantages of being part of a large system.

Significant Examples

A state-wide investigation of municipally owned distribution systems in California, made recently by the writer, disclosed results in support of these statements. Sixteen towns buy power at approximately one cent per kwh. This they sell at the amazingly low total cost for distribution and maintenance of 0.51 cent per kwh. Interest and depreciation require an additional 0.33 cent. Thus the total average cost of purchasing and distributing a kilowatt-hour of electricity is slightly less than 2 cents. For the fiscal year 1927-28, the average net earnings, after deduction of interest and depreciation, amounted to 25.6 per cent of the present value of the plants, or 30.4 per cent on the total equity in the plants from reinvestment of earnings. These lighting system profits constituted 27 per cent of the total municipal revenues for the year. The total bonded indebtedness has been reduced, from surplus earnings, to 15 per cent of the present value of the plants. The average base rate for domestic lighting service is approximately 5 cents per kwh. It is reasonable to believe that similar results can be obtained by the average town with a population of 1,000 or more.

Notes on Street Lighting in American Cities— 1909 to 1930

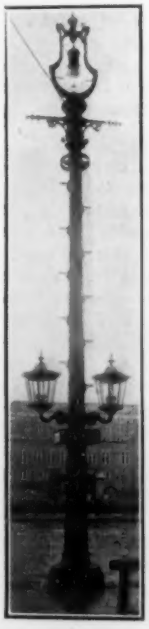
By PRESTON S. MILLAR

President, Electrical Testing Laboratories; Chairman, Committee on Street Lighting, Illuminating Engineering Society

WHEN THE AMERICAN CITY began its career, in 1909, streets of American cities which were lighted at night usually derived their illumination from arc lamps spaced from 250 to 1,000 feet apart. Sometimes gas lamps or carbon-filament electric lamps were installed between arc lamps. Such illuminants were also used in outlying districts. Some of the gas lamps were of the open-flame type, while others were mantle lamps. Among the electric incandescent lamps the 25-candlepower size predominated. From the present point of view, the street lighting afforded by such a means was meager indeed, yet it is doubtful whether it was not as well adapted to the requirements of that time as much of our street lighting is to the present day's requirements.

Evolution of Lamps

Among incandescent lamps, steps of progress have been from the use of the carbon filament to the vacuum tungsten filament lamps and then to the gas-filled lamps. These are now available in a great range of sizes. The recent development of a method of internal scouring to remove excessive blackening of very large lamps suggests the practicability of higher-power lamps in relatively smaller bulbs, making possible the employment of very large incandescent lamps for high-intensity street lighting. Of the smaller lamps, the 2,500-lumen size is considered to be the smallest that can be used with good economy under ordinary conditions.



ARC-LAMP POST
From *The American City*, 1910

The open arc lamp was largely replaced by the enclosed carbon arc lamp in order to promote economy and secure better distribution of light. This in turn was succeeded in many cases by the luminous arc lamp as the final American development in arc lighting.

In the process of these changes the increase in the expenditure of energy for street lighting has been of only a modest order. In the old days, 100 to 200 watts per 100 feet was usual. One outstanding installation of clusters of incandescent lamps for the lighting of business streets in Los Angeles was characterized by a consumption of 2,600 watts per 100 feet. The number of installations in the country today which exceed 300 watts per 100 feet is small. Most of the advance which has occurred is attributable to the increased efficiency of light production rather than to increased expenditure of electric power.

One particular in which the advance has been notable is in the installation of more attractive and creditable posts or mountings for street lamps, and in the placing underground of the circuits from which they are supplied.

Increased Expenditures Justified

It is the general feeling among those best acquainted with the subject that street lighting in our American cities as a whole is inadequate. It has not kept step with the modern requirements of high-speed congested traffic. Street lighting is considered to be so important a phase of municipal enterprise that present appropriations, usually not much exceeding $1 per capita, are considered to be inadequate. In spite of the ever-growing demand for shares of the tax dollar for various important and legitimate purposes, it is believed that a larger allotment for street lighting will return to municipalities a distinct profit in enhanced usefulness and appearance of the city streets, not to speak of greater safety and convenience.

It is contended that the lighting of streets should be regarded as an integral part of street improvement to be considered in the same connection with paving, for example. In order to obtain a proper return upon the investment in street construction, the relatively small amount of money required to provide adequate street illumination should be appropriated.

Technological Advances

There has been considerable advance during these twenty years in the technology of street lighting. The old idea of measuring in the street the candlepower of lamps or the illumination provided, has been replaced by emphasis upon prescription of the size and type of illuminant and its mode of operation, both of which are capable of being verified without difficulty. Another advance in technology is the growing recognition of the importance of placement of street lamps where they will be most effective in lighting the street. It is now generally agreed that lamps mounted over curbs are materially less effective than are lamps placed on brackets out over the driveway. This is due principally to the prevailing specularity of our road surfacings. Where full advantage is taken of this knowledge material improve-

A MODERN FORM
For twin incandescent lamps

ment in the effectiveness of the street lighting results.

In the design of street-lighting equipment there has been progress. In the practice of 20 years ago the wide spacing of arc lamps made conspicuous the need for delivering light into the dark areas between lamps. This led to attempts to distribute the light from the widely spaced lamps in order to approach a condition of uniform illumination. This in turn often gave rise to prohibitive glare. After a swing to this extreme, the pendulum of street-lighting thought returned to a more moderate position. Latest designs in street-lighting equipment combine a measure of redirection of lighting along the street with the use of diffusive outer globes, which make for a more general distribution, a reduction in brightness of the unit, and a corresponding reduction in glare. It has come to be realized that the purpose of street lighting is to promote good seeing and that the final judgment of the merit of street-lighting installations must be ability to see by the light provided plus satisfactory appearance of the lighting equipment and of the street as lighted. Even in England, where within the past year or so efforts have been made to rate street-lighting systems in terms of minimum illumination between lamps, it is to be observed that in the most recently announced decision, the verdict rested upon the ability of those using the street to see with the aid of competitive street-lighting installations.

This question of ability to see at night in the streets is complicated by automobile headlighting. While considerable has been accomplished through regulatory measures in bringing about design of automobile headlights which will avoid the worst of glaring conditions, the problem of securing in practice adherence to such provisions has proved most difficult. The development of depressed beam headlights was a marked step in advance in reducing glare from these sources, yet it left much to be desired. There is a growing sentiment in favor of municipal provision of fixed street lighting adequate to warrant dispensing with uncontrolled headlights, and even with depressed beam headlights in city streets. Where this is done the street conditions are much more satisfactory both for drivers and for pedestrians. It is generally held that fixed street lighting adequate for this purpose is practicable under modern conditions. This being so, an important step in the improvement of traffic conditions may be taken by most cities in first insuring such lighting, and then doing away with the use of headlights within city limits, or, at least, in the most congested parts of the city.

For assistance in the further development of street lighting, the Committee on Street Lighting of the Illuminating Engineering Society is engaged in preparing a recommendatory code intended to afford guidance as to desirable practice. As the personnel of the committee includes representatives of all interests having an organized concern in the subject, it is believed that the recommendations in this code will be found to be judicious, unbiased and wholly in the public interest. If the code affords the constructive guidance which is expected of it, municipal engineers should find it a useful document.

Street-Lighting Costs for 1929 in 218 Cities

By OTTO P. ORTLIEB
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THE information in this report was obtained by means of a questionnaire sent to city officials in 253 cities in the United States above 30,000 in population. Replies were received from 218 cities, these having 93 per cent of the total population of all cities above 30,000. It was requested that the costs reported include the charges of the operating company or the costs of the municipal system, the administrative costs such as salaries, and also the interest and sinking-fund requirements on any outstanding city bonds issued for street-lighting purposes.

Explanation of Table

First column: Names of cities in the order of population.

Second column: Population for 1929, estimated from the preliminary 1930 figures announced by the United States Bureau of the Census.

Third column: Total expenditure of each city for street lighting during 1929, or the fiscal year ending in 1929.

Fourth column: 1929 expenditure reduced to a per-capita basis.

Fifth column: Percentage increase, or decrease, in the per-capita cost during recent years. In most cases this covers the five-year period from 1924 to 1929. Where the data is for some other period, the number of years covered is indicated in parentheses. A minus sign indicates that there was a decrease in the per-capita cost. This annual percentage change was calculated so that it represents the average change occurring each year during the period covered.

The summary shows that the average cost of street lighting during 1929 for the 218 cities reporting was $1.191 per capita, and that there was an average increase of 5.0 per cent in the per-capita cost each year during the past five years. For 1928 (see The Municipal Index for 1930, pages 543-4) the corresponding figures were $1.100 and 4.2 per cent.

Sixth column: The future changes planned by these cities are listed as reported. There are 9 cities planning a large increase, 55 planning a moderate increase, 104 planning a small increase, and 37 not planning any change.

Seventh column: The total street mileage reported for the various cities. In numerous cases these figures are approximations rather than precise data, and no attempt has been made to analyze or summarize them. There are a number of cities in which a considerable proportion of the total street length is not provided with street lighting.

The questionnaire sent out was very short and did not go into detail regarding the street-lighting costs. Since there are many different methods used by such a large number of cities to pay for street lighting, a report of this nature cannot be considered altogether uniform. In some cities the installation cost of a new system may be paid in one year and costs in following years will not show this improvement, while in the case of a city paying a utility company for street lighting a part of the installation cost is usually included in the yearly rates as long as the lamps are in service. In some cases part or all of the cost is assessed directly against property owners, and might not be included in the city's report. Where cities have municipal systems it is sometimes difficult to allocate properly all the depreciation and interest charges and this might cause some variation.

Since practically all of the foregoing variations would tend to indicate a lower cost than is actually the case, it may be assumed that the average per-capita cost is slightly higher than here reported. Although complete accuracy cannot be obtained in work of this nature, this report is believed to present a fair picture of street-lighting costs throughout the country.

This report is not an attempt to compare street-lighting systems, for it is understood that the cost per capita is not a fair basis for comparison. The per capita costs are given so that city officials interested in street lighting can see how their individual cities compare with others in this one respect; any local factors, including the type of lighting provided, can then be taken into account. The per-capita cost also presents a fairly good method of noting the progress made in street lighting. If the total yearly street-lighting expenditure of a city increases it does not necessarily mean that the lighting system is improving at the same rate; furthermore, local factors such as rate changes or improvements in design must be considered. However, by noting the increase, or decrease, in the per-capita cost, it is possible to make a better comparison of street-lighting progress.

1929 Street-Lighting Costs

	Population	Total cost	Cost per capita	Av. annual increase	Increase planned	Street mileage
New York, N. Y.	6,741,700	$5,217,592	$ .774	5.1%	Moderate	3,863
Chicago, Ill.	3,306,500	4,404,440	1.332	4.2 (6)	Small	....
Philadelphia	1,947,700	3,333,957	1.712	7.2	Moderate	....
Detroit, Mich.	1,507,300	1,335,142	.886	3.8	Large	2,604
Los Angeles, Calif.	1,166,000	2,453,158	2.104	—3.2 (1)	Moderate	4,899
Cleveland, Ohio	891,000	1,153,927	1.295	8.9	Moderate	1,129
St. Louis, Mo.	812,900	1,862,384	2.291	12.2	Moderate	1,027
Baltimore, Md.	784,300	1,513,899	1.930	4.6	Moderate	935
Boston, Mass.	782,700	1,010,513	1.291	4.2	Small	947
Pittsburgh, Pa.	662,100	838,564	1.267	1.6	Moderate	....
San Francisco, Calif.	614,000	800,000	1.303	5.0	Moderate	870
Buffalo, N. Y.	565,400	1,066,615	1.886	5.3	Small	702
Washington, D. C.	480,900	864,796	1.798	13.7	Large	494
Minneapolis, Minn.	454,400	459,478	1.011	0.4	Small	803
New Orleans, La.	448,900	423,913	.944	5.4 (4)	Large	1,093
Cincinnati, Ohio	444,500	732,212	1.647	8.5	Moderate	648
Newark, N. J.	441,200	505,000	1.145	6.6	Small	332
Indianapolis, Ind.	357,700	375,180	1.049	—0.9 (6)	Small	856
Seattle, Wash.	357,700	375,000	1.048	8.5	.....	1,422
Rochester, N. Y.	323,400	684,072	2.115	9.3	Moderate	519
Jersey City, N. J.	315,300	269,221	.855	4.3	Small	204
Louisville, Ky.	300,500	340,765	1.134	4.6	Moderate	550
Portland, Ore.	295,000	305,489	1.036	1.9	Small	1,243
Toledo, Ohio	286,000	347,352	1.215	4.4	Moderate	460
Denver, Colo.	284,500	291,066	1.023	2.7	Moderate	1,056
Oakland, Calif.	277,400	201,890	.728	1.4	Moderate	708
Houston, Texas	274,300	182,850	.667	6.2	Moderate	....
St. Paul, Minn.	267,300	316,385	1.184	3.4	Moderate	864
Atlanta, Ga.	260,300	263,680	1.013	3.5 (6)	Moderate	....
Providence, R. I.	254,400	265,707	1.044	1.6	Small	....
Dallas, Texas	250,300	139,000	.555	—2.7	Moderate	....
Birmingham, Ala.	249,800	168,000	.673	21.2	Small	700
Akron, Ohio	249,100	219,451	.881	8.3	.....	500
San Antonio, Texas	245,200	128,000	.522	3.2	Moderate	....
Memphis, Tenn.	243,100	207,341	.853	—0.1	Large	....
Omaha, Nebr.	211,900	217,456	1.026	1.6	Small	706
Syracuse, N. Y.	202,000	343,927	1.703	13.6 (4)	Moderate	....
Dayton, Ohio	195,500	147,561	.755	0.4	Small	290
Worcester, Mass.	195,300	290,414	1.487	2.7	Large	290
Richmond, Va.	181,800	117,625	.647	0.1	Moderate	398
Oklahoma City, Okla.	173,700	77,554	.448	0.0	Moderate	650
Youngstown, Ohio	166,200	166,259	1.000	12.8	Small	420
Grand Rapids, Mich.	165,200	150,273	.910	3.8	Small	387
New Haven, Conn.	162,600	165,680	1.019	2.5	Moderate	200
Hartford, Conn.	159,000	179,784	1.131	7.3	Moderate	159
Fort Worth, Texas	155,500	126,391	.813	3.2	Small	600
Flint, Mich.	149,900	101,054	.674	5.7	Small	525
Springfield, Mass.	148,300	234,491	1.581	2.6	Moderate	....
Bridgeport, Conn.	146,800	137,550	.937	1.1	Moderate	202
Scranton, Pa.	142,900	119,355	.835	6.8	Moderate	190
Des Moines, Iowa	142,300	235,647	1.656	3.1	Small	500
San Diego, Calif.	140,600	224,336	1.596	11.3	Moderate	770
Paterson, N. J.	138,000	150,000	1.087	7.2	Small	....
Salt Lake City, Utah	137,900	153,000	1.109	3.6	Small	531
Tulsa, Okla.	133,700	93,625	.700	8.8 (6)	Moderate	400
Long Beach, Calif.	132,800	169,940	1.280	14.5	Moderate	....
Jacksonville, Fla.	130,900	220,800	1.687	....	Small	561
Yonkers, N. Y.	130,800	289,887	2.216	3.8	Small	221
Norfolk, Va.	126,600	102,475	.809	0.6	Moderate	....
Albany, N. Y.	125,500	272,780	2.174	14.9	Moderate	190
Trenton, N. J.	122,300	226,522	1.852	11.0	Small	172
Kansas City, Kans.	121,100	109,603	.905	0.5	Small	343
Fall River, Mass.	117,300	133,403	1.137	1.8 (6)	Small	175
Camden, N. J.	117,100	157,773	1.347	5.6	Small	160
Cambridge, Mass.	114,900	137,388	1.196	11.1	None	127
Spokane, Wash.	114,400	77,850	.681	1.0	Small	566
New Bedford, Mass.	114,200	120,609	1.056	1.7	Small	....
Erie, Pa.	113,600	151,524	1.334	4.1	Moderate	....
Chattanooga, Tenn.	113,400	120,951	1.067	9.9	Moderate	....
Elizabeth, N. J.	112,700	119,000	1.056	2.1	Moderate	132
Fort Wayne, Ind.	112,300	103,837	.925	1.7	Small	106
Reading, Pa.	110,000	92,500	.841	2.8	Small	180
Tacoma, Wash.	105,800	110,000	1.040	4.5	Moderate	700
Wichita, Kans.	105,500	59,625	.565	2.2 (6)	Small	....
Wilmington, Del.	105,500	101,415	.961	3.9	Small	170
Knoxville, Tenn.	103,000	85,933	.834	0.5	Moderate	175
Lynn, Mass.	102,500	123,625	1.206	12.6	Moderate	....
Lowell, Mass.	102,300	151,372	1.480	2.9	None	152
Miami, Fla.	102,000	296,012	2.902	15.4	None	896
Peoria, Ill.	101,900	105,095	1.031	3.6	None	200
Evansville, Ind.	101,400	64,356	.635	—0.5	None	....
Duluth, Minn.	101,000	83,174	.824	7.3	Small	210
South Bend, Ind.	100,400	105,000	1.046	3.6	Small	298
Tampa, Fla.	99,700	180,350	1.809	12.6	Small	461
El Paso, Texas	99,500	66,686	.670	3.6	Small	232
Schenectady, N. Y.	95,100	205,983	2.166	8.4	Large	212
Allentown, Pa.	90,200	84,483	.937	5.3	Small	325
Lawrence, Mass.	85,400	119,569	1.400	10.0	Small	114
Wilkes-Barre, Pa.	85,200	79,547	.934	5.5	Small	114
Savannah, Ga.	84,600	70,413	.832	2.5	.....	147
Bayonne, N. J.	84,500	110,000	1.302	11.8	Small	53
Rockford, Ill.	83,000	47,835	.576	—4.0	Small	252
Harrisburg, Pa.	79,800	105,875	1.327	3.0	Small	183
Altoona, Pa.	79,400	48,150	.606	4.5	Moderate	195
Charlotte, N. C.	79,000	66,656	.844	2.8 (6)	Small	135
Berkeley, Calif.	79,000	68,274	.864	6.1 (4)	None	....
Saginaw, Mich.	78,600	69,372	.883	2.3	.....	295
Sioux City, Iowa	78,500	85,556	1.090	7.8	Small	700
Lansing, Mich.	76,300	110,286	1.445	—3.3	Moderate	202
Pawtucket, R. I.	75,700	69,413	.917	0.9	Small	165
Binghamton, N. Y.	75,700	95,661	1.264	12.0	Small	158
Lincoln, Nebr.	73,800	81,183	1.100	0.3	Moderate	185
East St. Louis, Ill.	73,300	54,332	.741	2.2	Moderate	350
Pasadena, Calif.	72,800	105,141	1.444	5.5	Moderate	....
Winston-Salem, N.C.	72,600	73,610	1.014	6.0	Small	265
Troy, N. Y.	72,300	105,099	1.454	3.6 (4)	Small	103
Niagara Falls, N. Y.	71,700	100,016	1.395	6.8	Small	182
Springfield, Ill.	70,600	49,111	.696	0.1	.....	171
Portland, Me.	70,300	122,921	1.749	2.9	Small	166
Quincy, Mass.	69,600	94,737	1.361	9.1	.....	161
Springfield, Ohio	67,600	71,949	1.064	4.1 (4)	Moderate	178
Roanoke, Va.	67,300	34,748	.516	3.6 (3)	Small	200
Lakewood, Ohio	67,000	67,188	1.003	4.3	Small	89
New Britain, Conn.	67,000	66,001	.985	4.5	Small	130
Johnstown, Pa.	66,900	44,487	.665	1.9	None	94
East Orange, N. J.	65,700	102,436	1.559	2.7	Moderate	76
Mobile, Ala.	65,300	54,123	.829	7.1	Large	116
Covington, Ky.	64,400	82,299	1.278	1.3 (1)	Small	97
Atlantic City, N. J.	64,200	181,500	2.827	5.7	Moderate	83
Cicero, Ill.	63,700	81,700	1.283	4.0	Moderate	120
Montgomery, Ala.	63,600	31,164	.490	0.6	.....	288
Passaic, N. J.	63,200	59,225	.937	5.5	None	64
Terre Haute, Ind.	62,900	70,000	1.113	...	None	....
Newton, Mass.	62,800	133,117	2.120	5.6	Small	255
Charleston, S. C.	62,700	77,615	1.238	8.5 (3)	Small	90
Pontiac, Mich.	62,400	54,825	.879	8.7	Small	210
Topeka, Kans.	62,300	61,157	.982	2.1	Small	180
Hammond, Ind.	61,700	62,757	1.017	2.5	Small	....
Oak Park, Ill.	61,400	67,875	1.105	10.3 (6)	None	108
Wheeling, W. Va.	61,200	50,676	.828	5.9	None	86
Bay City, Mich.	60,000	38,289	.638	—2.3	Small	194
Lancaster, Pa.	59,900	66,554	1.111	—1.6 (2)	None	70
Evanston, Ill.	59,300	44,335	.743	—.03	Large	....
Davenport, Iowa	59,100	89,900	1.521	5.7	None	....
Augusta, Ga.	58,900	58,026	.985	0.5	Small	....
Mount Vernon, N. Y.	58,800	130,000	2.211	7.6	Small	95
Charleston, W. Va.	58,300	39,600	.679	2.0	Small	145
Chester, Pa.	58,300	49,153	.843	15.9	Small	73
Bethlehem, Pa.	57,800	76,199	1.318	4.8 (6)	None	130
Hoboken, N. J.	57,700	40,851	.708	4.3	None	28
Medford, Mass.	57,300	58,000	1.012	8.2 (6)	Small	....
Holyoke, Mass.	57,300	31,000	.541	—4.7	Small	73
Malden, Mass.	57,100	55,584	.973	0.9	None	75
Madison, Wis.	55,900	67,647	1.210	5.0 (6)	None	....
San Jose, Calif.	55,800	59,933	1.074	4.5	Small	180
Beaumont, Texas	55,800	58,700	1.052	20.2 (6)	None	200
Springfield, Mo.	55,700	40,438	.726	9.4	.....	....
Hamtramck, Mich.	55,500	38,000	.685	—0.9	.....	40
Cedar Rapids, Iowa	54,900	60,000	1.093	7.4	Small	150
York, Pa.	54,500	76,250	1.399	8.4 (6)	None	225
Jackson, Mich.	54,200	60,244	1.112	2.9	Small	....
McKeesport, Pa.	53,800	46,980	.873	—.05	Small	....
Kalamazoo, Mich.	53,800	51,691	.961	—7.9	Small	120
Macon, Ga.	53,800	46,000	.855	—1.2	Small	130
East Chicago, Ind.	52,700	56,205	1.067	...	None	85
Highland Park, Mich.	52,200	57,417	1.100	2.2	None	50
New Rochelle, N. Y.	52,100	147,072	2.823	7.0	Small	122
Fresno, Calif.	51,800	95,950	1.852	4.3	Small	195
Waco, Texas	51,400	36,962	.719	—4.2	Moderate	350
Greensboro, N. C.	50,100	49,242	.983	4.4	Small	....
Pueblo, Colo.	49,400	77,737	1.574	—3.0 (1)	None	225
Woonsocket, R. I.	49,400	48,759	.987	5.7	Small	119
Columbia, S. C.	48,900	52,709	1.078	4.3	Small	152
Kenosha, Wis.	48,900	80,930	1.655	7.5	Small	146
Haverhill, Mass.	48,800	52,000	1.066	3.5	Small	150
New Castle, Pa.	48,300	78,501	1.625	16.2	Large	97
Elmira, N. Y.	47,600	73,000	1.534	1.5	Small	125
Stockton, Calif.	47,000	69,935	1.488	2.0	Small	183
Brookline, Mass.	46,500	84,545	1.818	—1.4	Small	42
Portsmouth, Va.	46,300	28,820	.622	2.8	None	110
Lexington, Ky.	45,300	64,413	1.422	4.3	.....	91
Chelsea, Mass.	45,300	45,074	.995	0.3	Small	42
Stamford, Conn.	45,200	64,857	1.435	1.1	Small	101
Jamestown, N. Y.	44,800	55,617	1.241	0.9	Moderate	116
Williamsport, Pa.	44,700	43,845	.981	3.0	Small	....
Waterloo, Iowa	44,100	44,082	1.000	—0.2	.....	254
Lorain, Ohio	43,800	55,092	1.258	13.8	None	....
Perth Amboy, N. J.	43,700	52,000	1.190	0.2 (6)	Small	....
Chicopee, Mass.	43,600	35,839	.822	3.1	Small	157
Wichita Falls, Texas	43,300	14,313	.331	—1.3	Small	200
Salem, Mass.	43,200	59,795	1.384	6.2	Small	65
Battle Creek, Mich.	42,600	51,000	1.197	8.2	Moderate	152
Lima, Ohio	42,100	43,118	1.024	3.2 (6)	None	98
Cranston, R. I.	41,900	34,965	.834	—0.4 (2)	None	300
Portsmouth, Ohio	41,800	33,290	.796	7.0	Small	70
Council Bluffs, Iowa	41,600	30,919	.743	0.8	None	....
Joliet, Ill.	41,400	26,983	.652	6.9	Small	....
Fitchburg, Mass.	41,300	70,000	1.695	6.9	None	150
Muskegon, Mich.	40,900	35,727	.874	2.3	None	150
Amarillo, Texas	40,300	40,292	1.000	1.4 (6)	Moderate	320
Butte, Mont.	39,700	62,600	1.577	...	Small	273
Lynchburg, Va.	39,500	30,309	.767	...	Small	....
Ogden, Utah	39,500	36,292	.919	1.8	Small	201
Oshkosh, Wis.	39,400	42,519	1.079	2.0 (3)	Small	....
Poughkeepsie, N. Y.	39,200	64,277	1.640	5.7	.....	57
Quincy, Ill.	38,900	38,596	.992	2.9	Small	70
Rock Island, Ill.	38,800	40,334	1.040	10.3	None	....
Sheboygan, Wis.	38,400	32,076	.835	1.7	Small	100
Hazelton, Pa.	38,400	41,000	1.068	5.9	Small	105
Meriden, Conn.	38,100	36,804	.966	1.0	Moderate	110
La Crosse, Wis.	37,800	37,256	.986	3.7	.....	108
St. Petersburg, Fla.	37,000	85,183	2.302	—5.3 (4)	None	850
Green Bay, Wis.	36,700	40,963	1.116	6.5	Small	....
Danville, Ill.	36,400	32,374	.889	...	None	130
Superior, Wis.	36,400	44,112	1.212	...	Small	71
Auburn, N. Y.	36,300	49,677	1.369	—0.7	None	86
Norristown, Pa.	35,500	26,642	.750	7.5	Moderate	67
Revere, Mass.	35,200	37,084	1.054	8.3	Small	93
Elgin, Ill.	35,000	35,000	1.000	9.7	Moderate	112
Orange, N. J.	34,800	46,084	1.324	2.9	None	40
Easton, Pa.	34,300	53,883	1.571	9.3 (6)	None	80
Kokomo, Ind.	32,400	45,790	1.413	1.5	None	172
Colorado Springs, Colo.	32,300	47,100	1.458	5.2	Small	143
Wilmington, N. C.	32,300	25,318	.784	4.2	Small	53
Moline, Ill.	32,200	41,500	1.289	8.4	Small	125
Watertown, N. Y.	32,200	26,137	.812	—12.5	Small	100
Muskogee, Okla.	31,800	41,000	1.289	10.4 (6)	None	72
Newburgh, N. Y.	31,100	43,871	1.411	2.8	Moderate	48

SUMMARY OF STREET-LIGHTING COSTS

	Population	Total Cost	Cost per Capita	Av. Annual Increase
37 cities above 200,000	27,556,400	$33,617,422	$1.220	5.2%
46 cities, 100,000 to 200,000	5,996,400	6,763,348	1.128	5.0
26 cities, 70,000 to 100,000	2,086,600	2,375,522	1.138	4.8
51 cities, 50,000 to 70,000	3,026,700	3,375,801	1.115	4.5
58 cities, 30,000 to 50,000	2,351,600	2,731,938	1.162	3.6
218 cities	41,017,700	$48,864,031	$1.191	5.0%

THEN and NOW

SAMUEL A. CARLSON

In 1908, the year before *The American City* was born, Mr. Carlson was first elected Mayor of Jamestown, N. Y. Except for one term of two years, he has served his city in that capacity ever since.

FREDERICK W. DONNELLY

In 1907 Mr. Donnelly became a member of the Harbor Board of Trenton, N. J. In 1911 he was elected Mayor, and has served his city as its chief executive without intermission ever since.

CHARLES S. ASHLEY

The picture at the left was taken in 1888, when Mr. Ashley first became a candidate for Mayor of New Bedford, Mass. He was elected Mayor in 1890 and for the present and most of the intervening terms.

THEN and NOW

GEORGE BLACK

As Superintendent of Public Safety, Mr. Black has served the city of Wilmington, Del., since 1902. He has also been for many years the Secretary of the International Association of Chiefs of Police.

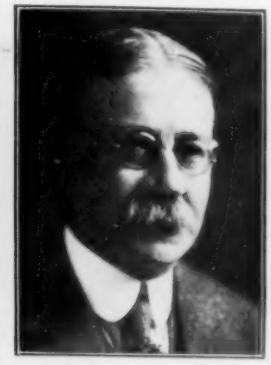
JOHN NOLEN

The portrait at the left is reproduced from one which accompanied an article in Volume I, No. 1, of *The American City*, by this pioneer and still vigorous town and city planner.

NEWTON D. BAKER

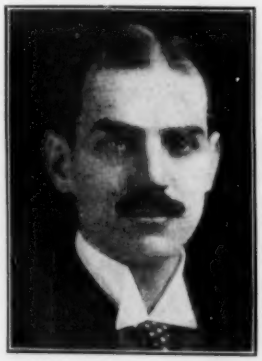
The youthful portrait of the then City Solicitor of Cleveland accompanied an article in Vol. II of this magazine. As is well known, Mr. Baker since served as Mayor of Cleveland and Secretary of War.

THEN and NOW



J. HORACE McFARLAND

The portrait at the left is from the second issue of *The American City* (October, 1909). Mr. McFarland has promoted civic progress ever since—most of the time as President of the American Civic Association.



Underwood & Underwood

RICHARD B. WATROUS

Then Secretary of the American Civic Association, Mr. Watrous was one of the contributors to Volume I of *The American City*. He is now Secretary of the Providence Chamber of Commerce.

CLINTON ROGERS WOODRUFF

Mr. Woodruff was another contributor to Volume I of this magazine. He was Secretary of the National Municipal League from 1894 to 1920, and since then, Honorary Secretary.

THEN and NOW

MUNSON HAVENS

Beginning his service with the Cleveland Chamber of Commerce in 1898, Mr. Havens was appointed Secretary in 1905, and has held that position ever since. The portrait at the left was taken in 1911.

ROLAND B. WOODWARD

With the exception of a brief interregnum, Mr. Woodward has been Secretary or Executive Vice-President of the Rochester Chamber of Commerce, of Rochester, N. Y., since 1909.

VINCENT S. STEVENS

As Secretary of its Chamber of Commerce, Mr. Stevens has served the city of Akron, Ohio, since 1908. For the two previous years he had been an Assistant Secretary of the Detroit Board of Commerce.

PICTURING PUBLIC PROGRESS

THE OLD PUBLIC SQUARE, PARIS, TEXAS,—AND THE NEW

The last-minute news of civic progress in Paris, as of August, 1911, is illustrated in the left-hand view above. This picture is reproduced from *The American City* of that date, in which appeared an article on new bandstands. In contrast is the Public Plaza of today, with its $50,000 Italian fountain, a gift to the city by J. J. Culbertson, one of the city's leading citizens. This is shown at the right, above

THE MUNICIPAL BUILDING, ROANOKE, VA., 1909-1930

The record of Roanoke's Administrative Center is to be told in terms of Past, Present, and Future. The present Municipal Building, shown at the right, above, occupies the place of chief importance in the Civic Center Plan which is a part of the Comprehensive City Plan of 1928, and for which are proposed a Federal Building, a Post Office, and a plaza

IN CINCINNATI, OHIO, A CANAL GIVES PLACE TO A PARKWAY

The "elbow" of Canal and Plum Streets as it appeared for many years is shown in the upper illustration, taken in November, 1919. The lower photograph was taken from the same point in July, 1928. Meantime the canal had been covered, and Central Parkway developed

THE CLEVELAND GROUP PLAN OF 1900

This "first prearranged public building group in the United States" represented the architectural collaboration of Daniel H. Burnham, of Chicago, and John M. Carrére and Arnold W. Brunner, of New York. A prominent element of the design was the railroad station and plaza development shown in the foreground above

THE CLEVELAND MALL OF 1930—AND AFTER

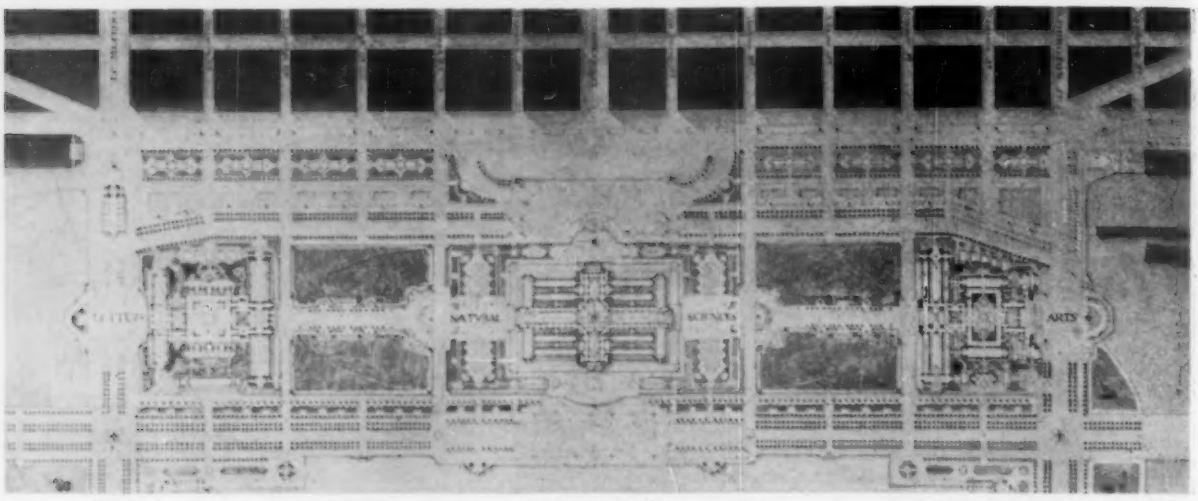
As will be seen from this airplane photograph, several buildings have been erected in conformity with the 1900 plan. The railroad station, however, originally conceived as a low classic structure closing the vista down the central plaza, is as actually developed the towering structure at the right center. The vista is left open to the lake, and the greatly enlarged plans now under consideration involve development of waterfront airport and recreation areas

The Malaga Grove, or Town Center Section, 1922-1930

PALOS VERDES, CALIF., BEFORE AND AFTER

This residential suburb of Los Angeles, started in 1922, has been called one of the four most perfectly developed communities in America. Its planners are Olmsted Brothers of Brookline, Mass., with Charles H. Cheney, the latter now acting also as Secretary of the Art Jury which passes upon all plans for buildings and other structures. Two of the principal problems faced —and triumphantly overcome, as the illustrations prove—were the rough character of the hillside where ugly scars would have been difficult to conceal if developments were not carefully designed; and the arid condition, unfriendly to all planting. The character of vegetation suitable to the site has been made the subject of careful study, and with material grown in a nursery on the property, large areas have been beautifully landscaped.

A section of the hills, 1922-1930, with La Venta, The Inn, below, glimpsed through the trees on the skyline



THE 1908 PLAN

How Grant Park Has Risen Out of Lake Michigan

GRANT Park is the central feature of the Chicago Plan as finished by Daniel H. Burnham and Edward H. Bennett and presented by the Commercial Club to the city in 1908. Its axis was placed at Congress Street and its design symmetrically arranged with reference to that line. For 20 years the 400-acre area has been evolving by the pushing back of the waters of the lake in accordance with the original plan as reproduced above, except that legal barriers have arisen from the original dedication of the park preventing the development of the three groups of buildings. The Field Museum has been placed south of 12th Street fronting on the park and the Art Museum is expanding across the railroad tracks from its location as shown above.

After numerous experiments in tree planting, elms were used to outline the main divisions of the park and now give fair promise of permanence. The area has for several years been graded and sodded, with paths and terraces laid in gravel, and with great north and south park roads. The eastern road or Outer Drive now being constructed will run continuously north.

Embellishments will come slowly, and mostly in connection with the many bridges spanning the Illinois Central Railroad, the most important of which is at Congress Street. Pylons, fountains, retaining walls and balustrades have been built, and some sculpture placed. The horses of Mestrovic, in bronze, stand near the axis. Memorials of various sorts have been proposed. One of Pasteur has been placed. But the most imposing element in the design is the Buckingham Memorial Fountain (already described in this magazine), from the office of Bennett, Parsons and Frost, which is responsible for all of the park development plans. Electrification of the Illinois Central will in time provide some covering of the tracks, especially as the great air rights north of Randolph Street are developed. The plan if consistently carried out will afford a worthy central waterfront to the city.

Chicago Aerial Survey

THE 1930 REALITY

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

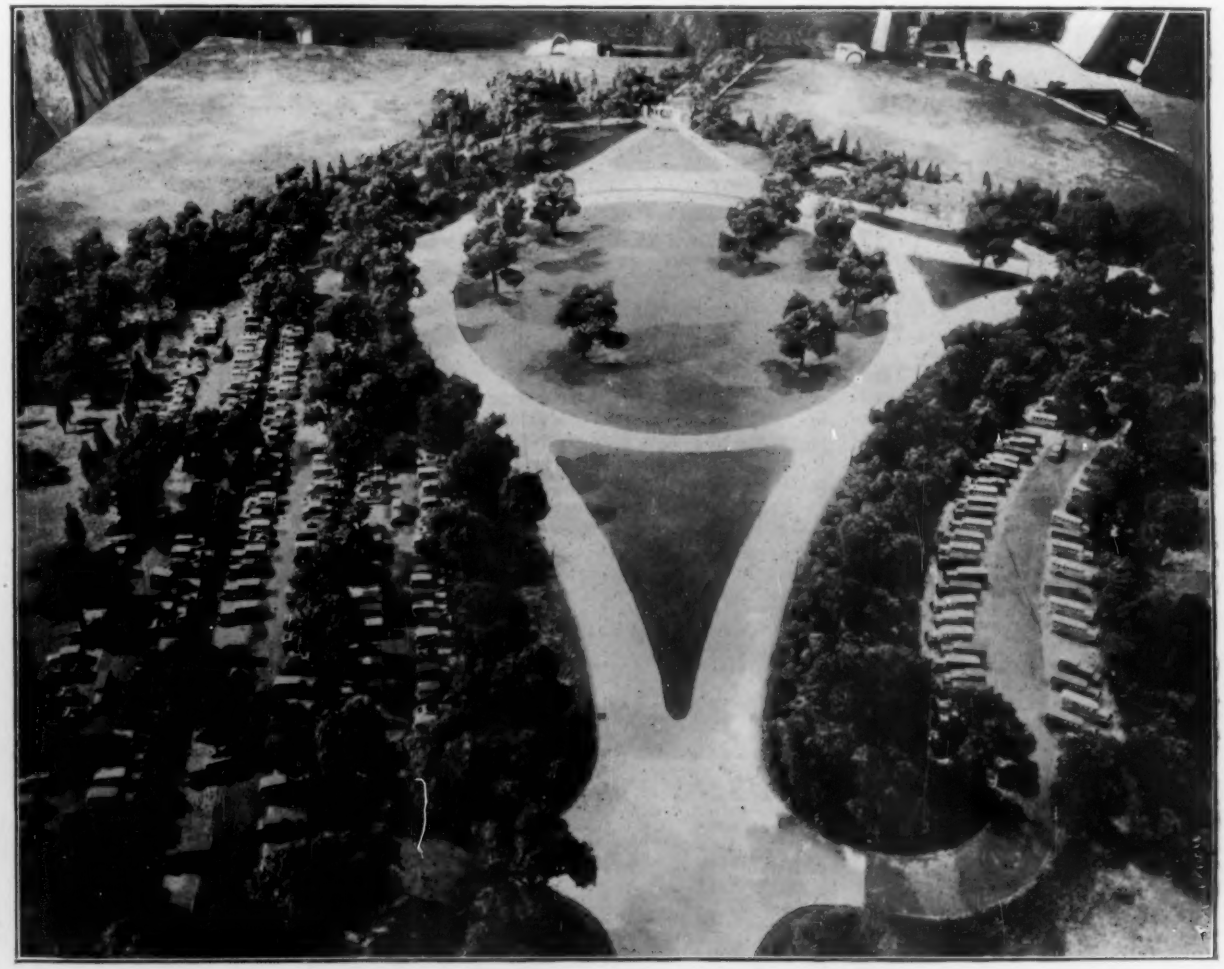
Modern Design Characterizes Highway Memorial to George Washington

WASHINGTON, D. C.—The Mount Vernon Memorial Highway, now under construction by the U. S. Bureau of Public Roads, extends from a point on Columbia Island, south of Arlington Memorial Bridge, to Mount Vernon, a distance of 15½ miles, and passes through historic Alexandria, Va.

The highway follows the Virginia shore of the Potomac River as closely as possible. It crosses several estuaries on hydraulic fills and bridges. It has a maximum width of right-of-way of 200 feet and a general pavement width of 40 feet. In Alexandria it follows Washington Street, the main thoroughfare, some 56 feet wide.

For a quarter of a mile between the highway and the Richmond, Fredericksburg & Potomac Railroad bridge spanning the Potomac River near the north terminus of the highway, the pavement is divided, each strip being 40 feet wide, with a center parkway 15 feet wide. At the more important access roads, the pavement is also divided, in some places for a distance of 300 feet on each side of the entering highway, in others as far as 600 feet on each side. In one case the entrances to the Memorial Highway are staggered to provide maximum safety to traffic. Several underpasses and overpasses take care of a large amount of cross traffic.

At high points along the river, where particularly beautiful views of the Potomac may be had, the roadway is widened to allow parking of automobiles. A grade separation structure, south of the highway bridge, permits an interchange of traffic over its four ramps from the two levels and eliminates all left-hand turns. The roadbed of the highway is designed with long, easy curves, fitting into the topography of the country. It is also so designed that acquisition of areas on each side of the right-of-way



Photograph by J. K. Hillers; courtesy of U. S. Bureau of Public Roads

MODEL OF HIGHWAY AND PROPOSED PLANTING
The Mount Vernon approach area of the Mount Vernon Memorial Highway, showing provision for automobile bus parking

will form protective barriers against encroachment of undesirable structures of all kinds.

The approach to Mount Vernon has been designed to permit the arrival and departure of cars and busses without confusion. Ample parking space for both private cars and busses has been provided and has been screened from view by a careful arrangement of planting. The combined design of road and planting scheme gives a scenic beauty to the approach area comparable to that beyond the entrance gate.

A highway memorial to George Washington has been talked of for some forty years, but it was not until May 23, 1926, that Congress authorized the George Washington Bicentennial Commission, created by it in 1924, to take the necessary steps to construct such a highway, for which it authorized an appropriation of $4,500,000. Congress also directed the Secretary of Agriculture to cooperate with the Commission. The Secretary, in turn, delegated to the Bureau of Public Roads the making of surveys, plans and specifications and the working-out of all details involved in the actual construction.

Construction work was started in September, 1929, and the highway will be open for travel in time for the bicentennial celebration in 1932 of the birth of the first President of the United States.

H. S. FAIRBANK,
Highway Engineer, Bureau of Public Roads.

City and Insurance Company Arrange Retirement and Benefit Plan

ALTOONA, PA.—This city has recently prepared and put into effect a comprehensive old-age retirement and benefit plan for all city employees, in which the city and the employees both cooperate in making the benefits possible. The plan has been worked out with the Metropolitan Life Insurance Co., and Altoona is said to be the first city in the United States to adopt for its employees such a plan insured with an insurance company. The scope and amount of the various benefits are indicated in the table published herewith. The normal retirement age is 65 years.

As an example of how the plan would work out as to an average employee, a person taking advantage of the plan at the age of thirty, after five years of service, and progressing from salary grade B through C to D, would begin to receive upon retirement at the age of 65, a life income of $77.50 a month. The plan provides total and permanent disability benefits in addition to those listed in the table. The employees taking advantage of the plan are entitled to the visiting nurse service and the valuable health literature of the insurance company. One special feature is that the contract with the insurance company prevents any new administration from canceling or reducing any pension already being paid, or altering any of the benefits purchased.

The plan is under the supervision of the undersigned. The City Council, headed by Mayor J. J. McMurray, has issued a pamphlet describing the plan in detail.

WILLIAM T. CANAN,
City Controller.

SCHEDULE OF BENEFITS AND CONTRIBUTIONS

Annual Salary	Salary Class	Monthly Rate of Retirement Income for Each Completed Year as a Contributor in Salary Class	Weekly Sick and Non-occupational Accident Benefits	Weekly Occupational Accident Benefits	Life Insurance	Your Monthly Contribution	Cash Surrender Value in Case of Withdrawal or Death Before Retirement
$1,000 and less	A	$1.00	$10	$0	$700	$1.20	Five-sixths of your total contributions, one-sixth being cost of insurance benefits
1,001-1,400	B	1.50	12	0	1,000	1.80	
1,401-1,600	C	2.00	15	6	1,400	2.40	
1,601-1,850	D	2.25	18	8	1,500	2.70	
1,851-2,100	E	2.50	20	14	1,700	3.00	
2,101 and over	F	3.00	20	14	2,000	3.60	

RETIREMENT INCOME FOR PAST SERVICE

The city of Altoona has secured for its employees an additional retirement income recognizing past service. This additional retirement income is two-thirds of the amount indicated in the schedule for each present salary class, multiplied by the number of years of service completed prior to adoption of this plan on January 15, 1930.

A Summer School for Crippled Children

APPLETON, WIS.—Twenty-two crippled children, most of them victims of infantile paralysis, are receiving treatment and training in a special school conducted for them here this summer. Although all the children are cripples, to see the youngsters down on their knees planting flowers, playing ball on the lawn or eating with the relish of hired hands in hay time, one would hardly guess that they are different from any normal child.

The school is sponsored by the Appleton Department of Education, although its establishment was the direct result of considerable work on the part of the Appleton Civic Council. This body, composed of representatives of the city's fraternal, social and other groups, made a preliminary survey to determine the need for such a school and estimate the cost of operation.

Now the school has been taken over by the city school department and it is expected that state aid will be given the work. The present session is to last through the summer months, and a regular fall term will start at the same time as the regular schools next September. The building where the school is in progress formerly was used as a girls' dormitory by Lawrence College.

Bright, eager children, not yet old enough to bewail their misfortunes, the boys and girls have a pleasant time in their pursuit of health and knowledge. Lessons in July and August are no hardship when there are frequent recesses on the sunny lawn, ball games and other games that active youngsters love to play, as well as treatments by ultra-violet and infra-red rays by which the little limbs and backs are gradually being coaxed back to normal. Classes aren't so cut-and-dried as in regular school sessions. First of all, they are informal. Sessions are shorter and—more fortune—so are the assignments.

The children are a merry lot vitally interested in the comings and goings of their little community. They wriggle in their specially built seats and gaze out of the windows at the lawn sloping away to the Fox River below. Afternoon siestas on cots are provided, where the children can rest and sleep in the beneficial rays of the sun. At 2:30 p.m. the day ends with a taxi to call for them and take them to their homes, either in Appleton or in the surrounding community.

MARTIN FRANCIS.

Modern Lighting in Business Section of City with Long Electrical History

APPLETON, WIS.—This city, where the first hydro-electric plant in the world was established, in 1882, and which is also credited with the first electric street railway, is now enjoying the benefits of a modern street-lighting system on its most important business street, College Avenue. The new lighting supplants an old and inadequate installation consisting of 250-candlepower lamps mounted on 26-foot poles. The superseded system necessitated heavy maintenance costs.

College Avenue was originally illuminated by gas, but about 1888 several progressive citizens started a movement for electric lighting, which resulted in the installation of arc lights designed by the late Elmer A. Sperry, and the building of a generating plant to supply the system. The lamps were hung above the streets at intersections. The recently superseded ornamental system with the high poles was installed about 1916, the poles costing $136 apiece, it is said. It is expected that a few of these will be utilized by the city in special locations, such as the municipal swimming pool, and at the foot of a hillside stairway leading to a school. The rest of the poles had to be sold as junk.

The new system consists of 81 Union Metal Manufacturing Co. standards, 17 feet high, each carrying two 400-candlepower General Electric Co. lighting units, equipped with refractors to distribute the light along the street to the best advantage. At the main intersection there are standards on all four corners, giving a concentration of light that is a great advantage to traffic. Elsewhere the standards are placed 100 to 110 feet apart.

Underground cable is used for the lighting circuits, which are arranged in a "group series" system. The entire number of lamps is divided into three circuits. Two of these divide at Superior Street, each with a transformer to regulate the constant flow of current in the circuit. A third circuit, with its separate transformer, takes in scattered lights throughout the system, these being the all-night lamps. The other lamps burn until midnight.

The old system included individual transformers with each pole, these being placed underground at the pole base. They were the source of considerable trouble, particularly in winter, when ice that formed around the transformer boxes during the day would melt when the circuit was operating. The contraction and expansion of the boxes, and the freezing and thawing of the water, which sometimes got into the transformer, were sources of trouble. In the new system the three transformers for the entire installation are mounted on platforms high above the ground.

The cost of the new lighting installation is borne jointly by the city and the abutting property owners, the city paying one-third and the owners two-thirds, divided equally as to each side of the street. The property owners' share amounts to about $2.70 per front foot. This allocation is different from that prevailing in the case of installations in residence districts, where the city pays 50 per cent and the property owners on each side of the street 25 per cent.

Lighting current is furnished by the Wisconsin Michigan Power Co., under a new ten-year contract. The rates under this contract, which include servicing, and replacement of burnt-out lamps, are as follows: 600-candlepower lamps, $50 per year; 400-cp., $40; 250-cp., $28; 100-cp., $20; and for 400-cp. lamps burning to midnight only, $27. The system has been installed by the Arft Killoren Electric Co.

LIGHTING STANDARD, APPLETON, WIS.

COLLEGE AVENUE, APPLETON, WIS., SHOWING NEW LIGHTING

The Appleton Chamber of Commerce was active in bringing about the new lighting, during the administration and with the cooperation of former Mayor Albert C. Rule. It has been functioning successfully during the current year and is thoroughly approved by the present administration.

JOHN GOODLAND, JR.,
Mayor.

Impounding of Illegally Parked Automobiles Reduces Traffic Problem

DALLAS, TEXAS.—For more than a year we have been aided in our efforts to cope with traffic problems, by an ordinance that applies to parked motor-cars the old common-law idea that obstructions left upon the streets are nuisances, and treats them in the same way that has been used in the case of animals found upon the highway, namely, by impounding them.

An average of 900 automobiles are impounded each month, for such offenses as double parking, blocking fire plug, driveways, etc., parking in loading zones or fire lanes, and other kinds of illegal parking.

The ordinance has helped us materially with our traffic problems in that it has eliminated to a great extent double and overtime parking, which were our chief difficulties along this line.

The chief portions of the ordinance (No. 1997) are as follows:

Whereas, from time immemorial, wilful obstructions left upon the streets and public highways and thoroughfares have been a nuisance *per se* at common law; and,

Whereas, obstructions left upon the streets and sidewalks of this city, owing to magnitude of traffic, both pedestrian and vehicular, constitute a serious menace to the health and safety of the public at large, and have caused serious and numerous injuries, resulting in loss and injury to life and property; and,

Whereas, numerous cars have been stolen and left unattended upon the streets of the city for weeks, providing automobile thieves with the opportunity for stripping cars and leaving them, and thus having several days in which to evade the police authorities before such cars are reported as lost or stolen: Now, therefore,

Be it ordained by the Board of Commissioners of the city of Dallas:

Section 1.—That in the event any property of any description, vehicle, horse or any obstruction, shall be found existing, standing, parked, ranked, erected or lying in or upon any part of any public street, avenue, alley, sidewalk, thoroughfare, park or other public place within the corporate limits of the city of Dallas, Texas, in violation of and contrary to any of the rules, regulations and ordinances of said city that are now or may be hereafter in effect, the same shall be a nuisance and shall be removed by any police officer and taken to Police Headquarters, or some other place set aside for such purpose by the Board of Commissioners, and there kept by some officer until application for its redemption shall be made by the owner or his duly authorized agent, who shall be entitled to the possession thereof upon the payment to said city of Dallas of the sum of $2.00, together with all other costs of removal and storage that may have accrued thereon.

Section 2.—In the event the property impounded shall not be redeemed by its owner, or his agent, within five days, then said property shall be sold for such penalty, charges and costs, in the manner, as nearly as practicable, now provided by Articles 1403 and 1404 of the Revised Ordinances of the city of Dallas, Texas, for the sale of impounded animals.

C. W. TRAMMELL,
Chief of Police.

More Improvements, Better Bond Rates, Lower Taxes, Under City-Manager Rule

REDWOOD CITY, CALIF.—The middle of the current year has marked the completion of the first fiscal year under the new charter of this city and the administration of City Manager E. A. Rolison. A review of this period has been rendered to the City Council by the undersigned, parts of which report are given herewith:

"Every department is now rendering more effective public service than was possible under the former government, which in reality lacked a central executive officer.

"During the year just closed, a reduction was made in both taxes and business licenses, the latter reduction being very substantial. Notwithstanding this reduction, substantial additions were made to several departments of the government, notably the Fire Department, Yacht Harbor and Public Library. Also, the condition of our city's equipment has been improved, all trucks and automobiles having been completely overhauled mechanically and repainted where appropriate. Streets, sewers and parks

have been well maintained. The public library has extended its equipment, improved its facilities and increased in public esteem and use. A new corporation yard and warehouse have been purchased for cash; they will adequately provide storage for supplies for the street, water, sewer and lighting departments of the city for many years. A new animal shelter, which is one of the finest for any city of this size in the country, has been constructed from funds obtained from Mrs. Marguerite Courtney through Mr. Rolison's knowledge of her interest in humane work.

"After accomplishing these results with the money provided by a reduced tax rate and reduced business licenses, a surplus of between $6,000 and $7,000 remained. The 1930-1931 tax rate will be approximately nine cents less than that of last year.

"In this connection it is to be noted that Redwood City recently sold upon the most favorable basis ever obtained $55,000 of city bonds for bridges, drainage channels and culverts.

"An instance of the efficiency of our city manager is found in the substantial refund obtained from the Pacific Gas and Electric Co. through an order of the California Railroad Commission and the decision rendered a few days ago granting our application for a substantial permanent reduction in the cost of our street lighting and power for our publicly owned Water Department.

"Improvements in each of the various departments could be metnioned, but I think the present review suffices to show the businesslike manner in which the public business of Redwood City has been conducted during the past year."

PAUL A. McCARTHY,
Councilman.

How Spokane Is Securing Its New Chamber of Commerce Building

SPOKANE, WASH.—"A Chamber of Commerce should always be on the ground floor. It is the host that invites visitors to a city, it should be where they can conveniently see and find it, and where it can efficiently serve them." This is the theory held by B. H. Kizer, President of the Spokane Chamber of Commerce, and the moving spirit behind the proposed new home to house the civic body which he heads.

The plans for the building and the financing are complete; in fact, there has been an over-subscription of the second mortgage bonds, and the verdict is that the new project will provide a building that will double the efficiency of the Chamber at but little extra cost. Renaissance in character, with an open loggia, and a decorative frieze symbolizing the industries and products of the Inland Empire, the building will fill a gap in a row of beautiful buildings in the city's civic center.

The site is a gift from the Finch estate, left by a wealthy mining man and being administered for civic development, and from W. H. Cowles, publisher of the *Spokane Chronicle* and the *Spokane Spokesman-Review*. This gift is made to the Spokane Civic Building Co., which will erect the building and issue the bonds secured by deeds of trust. It will be landlord of the Chamber, which will rent the building for a period of twenty years at an annual rental sufficient to pay the interest on both bond issues, plus an annual retirement commencing at $2,000 and growing as the interest diminishes. This annual retirement will be on the first mortgage bonds, which will thereby steadily improve with each year the security of the second mortgage bonds. The second mortgage bonds will be payable "on or before," and it is anticipated that before the twenty years are up, so much of the first mortgage bonds will have been paid off that a single issue of the first mortgage will retire the second mortgage bonds. The income payable from the Chamber of Commerce to the Civic Building Co. will likewise be assigned to pay and discharge first the interest and then the principal upon these two bond issues. Construction and furnishing costs are set at a trifle less than $125,000. Spokane bankers will underwrite $85,000, these bonds to be offered to the general public, and the balance of $40,000 is to be funded in an issue of 6 per cent second mortgage gold bonds.

ARCHITECT'S DRAWING OF PROPOSED NEW BUILDING FOR SPOKANE CHAMBER OF COMMERCE

It is hoped to sublet office space to the secretarial staff of such other bodies as the Spokane Advertising Club, the Rotary, etc., and also to the Inland Automobile Association. Construction of the building began in August, and it is expected to be completed when the lease of the Spokane Chamber of Commerce on its present quarters expires, April 1, 1931.

JAMES A. FORD,
Managing Secretary, Spokane Chamber of Commerce.

To Encourage Municipal Individuality

THE individuality of communities, cities and regions, and how to preserve and enhance it, will be given intensive study during the coming winter and spring by the City and Regional Planning Committee of the American Institute of Architects, of which Charles H. Cheney of Palos Verdes, Calif., is Chairman. The American City Planning Institute, American Society of Landscape Architects, American Civic Association and Better Homes in American Federation have been asked to appoint representatives to collaborate in this study, the findings of which are expected to have far-reaching effect on improving the appearance of American cities.

The same subject of inquiry has also been proposed by Mr. Cheney to the International Federation for Housing and Town Planning, and it is hoped to have accurate statements of the planning measures which have been found effective, particularly in the older countries of Europe, published and available by the time that the findings in this country are brought together.

"With the vast changes in cities and regions going on in this country due to the abandonment of a horse-and-buggy age, and the adoption of motor vehicles and the aeroplane, only pitifully few of our cities have been able to retain any marked individuality and attractiveness," said Mr. Cheney, recently.

"In New England, in the old South and in some places on the Pacific Coast we have a few places of character left. But the unnecessarily ugly main street, the 90 per cent of careless, badly designed, and off-color buildings going up everywhere, are smothering all our decent heritage, destroying values and leaving us little that is sound or satisfactory as the product of this generation.

"It is time that the country woke up and grappled with this very serious problem. We expect to analyze the places where individuality and character have been maintained and to give widespread notice of the practical and constructive measures that can be taken to recapture these qualities in communities, cities and regions."

Twenty-One Years or More in Their Present Posts

These Mayors, City Engineers and Department Heads Have Served Their Communities Since 1909 or Longer, in the Positions They Still Occupy

THE following list, which is doubtless far from complete, has been compiled from the office records of THE AMERICAN CITY, and from replies received during the last few weeks to a brief item in the August number, supplemented by a letter to the secretary of the league of municipalities in states having such bodies. The request was for the names of officials and department heads who have been serving their respective municipalities in their present capacities since 1909 or longer. The dates shown in parentheses following the names indicate the year of election or appointment to the present position.

In many cases the replies included names of such persons who have had twenty-one years or more of municipal service, but less than that period in the position now occupied. The limits of space available have necessitated the omission of such names, and also the omission of many whose titles do not come within the scope of the present list, which is restricted to: Mayor, clerk, treasurer, auditor, engineer, chief of police, fire chief, and heads of departments including water, light, streets, parks, public welfare and schools.

Several cities furnished lists of surprising length of employees in major or important minor capacities whose terms of service to the municipality would have qualified them for inclusion if the list had not been restricted as above. Among these may be mentioned Cleveland, with 16 names, Milwaukee, with 13, and Trenton, N. J., with ten.

Alabama

GADSDEN
S. L. O'Bannon, Police Chief (1907)
MOBILE
Wright Smith, City Eng'r (1905)
MONTGOMERY
W. H. Taylor, Police Chief (1906)
OXFORD
D. C. Cooper, Mayor (1908)
SCOTTSBORO
J. D. Snodgrass, Mayor (1890)

California

BERKELEY
August Vollmer, Chief of Police (1905)
EMERYVILLE
W. H. Christie, Mayor (1896)
GLENDALE
P. Diederich, Supt., Water-Works (1909)
SANTA CRUZ
Robert S. Tait, Supt., Water-Works (1909)
VALLEJO
W. T. Stanford, Police Chief (1900)

Colorado

COLORADO SPRINGS
B. B. McReynolds, Supt. Water-Works (1909)
P. D. McCartin, Fire Chief (1909)

Delaware

MILFORD
W. T. Banning, Supt., Water-Works (1893)
WILMINGTON
Frank W. Pierson, Street Commissioner (1899)
George Black, Police Chief (1902)

Florida

ORLANDO
William Dean, Fire Chief (1885)

Georgia

DUBLIN
M. J. Guyton, City Eng'r (1908)
NEWNAN
H. H. North, Supt., Water-Works (1904)
VALDOSTA
W. H. Gainey, Chief of Construction (1899)

Illinois

BLUE ISLAND
Richard B. Hammond, Supt., Water-Works (1905)
CANTON
Joseph Waugh, City Clerk (1900)
MATTOON
Claude L. James, Supt., Water-Works (1907)
MURPHYSBORO
Albert Herring, Fire Chief (1901)
OTTAWA
Jos. Boissenin, Fire Chief (1909)
PEKIN
Julius F. Jaeckel, Fire Chief (1889)
QUINCY
William R. Gelston, Supt., Water-Works (1907)
ROCKFORD
A. E. Bargren, Police Chief (1892)
ROCK ISLAND
Wallace Treichler, City Engineer (1897)
M. T. Rudgren, City Clerk (1907)
August Schmidt, Fire Chief (1903)
Herman Schnert, Chief of Police (1907)
WAUKEGAN
Sars O'Farrell, Fire Chief (1902)

Indiana

COLUMBIA CITY
F. T. Schultz, Supt., Water-Works (1907)
FORT WAYNE
F. M. Randall, City Eng'r (1891)
RICHMOND
Howard A. Dill, Supt., Water-Works (1899)
E. E. Miller, Fire Chief (1903)

Iowa

ATLANTIC
T. E. Nichols, Supt. of Utilities (1906)
BOONE
Otto Hile, City Clerk (1905)
Wm. A. West, Fire Chief (1908)
CHEROKEE
Wm. Shardlow, City Clerk (1908)
Geo. Brummer, City Treas. (1907)
CONRAD
E. L. Guild, Treasurer (1902)
FORT DODGE
John W. Pray, Supt. Water-Works (1909)
LARCHWOOD
W. F. Ashton, City Clerk (1903)
MADRID
C. S. Adams, City Clerk (1902)
MASON CITY
J. H. McEwen, City Clerk (1902)
MUSCATINE
William P. Molis, Supt., Water-Works (1875)
NEVADA
R. A. Davis, City Clerk (1908)
OELWEIN
C. D. Shippy, Supt., Water-Works (1907)
OSCEOLA
W. N. Temple, City Clerk (1903)
SIOUX CITY
Phil Carlin, Supt., Water-Works (1891)
G. M. Kellogg, Fire Chief (1889)
WAPELLO
R. D. McCullough, City Treasurer (1896)

Kansas

ABILENE
M. H. Malott, City Treasurer (1898)
ATCHISON
H. N. Sowers, Fire Chief (1905)
BAXTER SPRINGS
J. W. Cook, City Treas. (1901)
BELLEVILLE
C. W. Elliott, Fire Chief (1885)
BELOIT
W. H. Troutman, Fire Chief (1906)
CHANUTE
E. M. Flannery, Supt., Water-Works (1908)
CHETOPA
E. D. Bates, City Treasurer (1895)
EMPORIA
Charles Stinson, Fire Chief (1906)
FORT SCOTT
M. W. Smith, Fire Chief (1895)
FREDONIA
J. J. Wolever, Fire Chief (1893)
GARNETT
Geo. Lacy, Fire Chief (1893)
HUTCHINSON
A. J. Stout, Fire Chief (1891)
INDEPENDENCE
J. C. Gordon, Supt., Water-Works (1905)
IOLA
T. H. Bowlus, City Treasurer (1900)
T. I. Christy, Police Chief (1909)
JUNCTION CITY
Wm. Bush, Fire Chief (1907)
KANSAS CITY
Olander Lind, Fire Chief (1895)
LAWRENCE
W. F. Reinisch, Fire Chief (1892)
MARYVILLE
A. W. Kersten, Fire Chief (1904)
MINNEAPOLIS
J. W. Smith, Ctiy Treas. (1888)
NEWTON
Adella Martin, City Clerk (1906)
OSAGE CITY
Ed. Martin, Fire Chief (1903)
OTTAWA
W. O. Myers, Supt., Water-Works (1903)
PARSONS
Walter A. Buel, Fire Chief (1902)
PEABODY
M. V. Brindley, Supt., Water-Works (1903)
PLEASANTON
C. H. Porter, City Clerk (1900)
SALINA
C. E. Banker, City Clerk (1399)
SOLOMON
G. M. Spaulding, City Clerk (1904)
TOPEKA
Jos. Waidelich, Fire Chief (1896)

Louisiana

NEW ORLEANS
George G. Earl, Supt., Water-Works (1900)

Maine

BREWER
Mary A. Burr, City Clerk (1909)
Chas. E. Lunt, Police Chief (1909)
LEWISTON
J. A. Jones, City Eng'r (1884)

Maryland

HAGERSTOWN
Albert Heard, Supt., Water-Works (1892)

Massachusetts

AMESBURY
J. P. Titcomb, City Eng'r (1887)
ARLINGTON
Thomas O. D. Urquhart, Chief of Police (1905)
ATTLEBORO
Lewis A. Fales, School Supt.
BEVERLY
R. H. Grant, Fire Chief (1909)
James W. Blackmer, Supt., Water-Works (1901)
BOSTON
W. J. Doyle, City Clerk
R. S. Carven, City Auditor
William P. Long, Park Commissioner
Thomas J. Hurley, Street Commissioner
John J. O'Callaghan, Street Commissioner
Christopher J. Carven, Supt., Water-Works
BROCKTON
Horace Kingman, Supt., Water-Works (1893)
CAMBRIDGE
L. M. Hastings, City Eng'r (1889)
CHELSEA
J. A. O'Brien, City Eng'r
DEDHAM
E. Worthington, Town Eng'r (1890)
EVERETT
W. E. Hill, Police Chief (1908)
GLOUCESTER
John W. Moran, Supt., Water-Works
GREAT BARRINGTON
Edward Kelly, Town Clerk (1906)
W. J. Oschinan, Police Chief (1907)
GREENFIELD
Philip Partenheimer, Fire Chief (1900)
Thos. Manning, Police Chief (1906)
HAVERHILL
W. W. Roberts, City Clerk (1893)
A. T. Jacobs, City Treas. (1904)
A. E. Leach, City Auditor (1909)
HOLYOKE
Pierre Bonvouloir, City Treasurer
D. W. Kenney, City Auditor
J. F. Sheehan, City Clerk
LAWRENCE
B. M. Sheridan, School Supt.
R. W. Priestman, City Eng'r
Michael McPhee, Fire Chief
T. J. O'Brien, Police Chief
LYNN
C. H. Tucker, City Auditor
J. W. Attwill, City Clerk
MALDEN
L. D. Holden, City Clerk (1882)
H. W. Estey, City Eng'r (1907)
MARLBOROUGH
P. B. Murphy, City Clerk
P. F. Crotty, Police Chief
Julian P. Wood, Supt., Water-Works
MILTON
David A. Heffernan, Supt., Water-Works (1902)
NEW BEDFORD
E. F. Dahill, Fire Chief (1903)
NEWTON
Francis Newhall, City Treasurer (1905)
Wm. P. Morse, City Eng'r
F. M. Grant, City Clerk
George E. Stuart, Street Commissioner
NORTHAMPTON
F. K. Congdon, School Supt.
NORTH ANDOVER
J. A. Duncan, Town Clerk (1909)
PEABODY
Albert Robinson, School Supt. (1903)
PITTSFIELD
F. M. Platt, City Treas. (1907)
Albert W. Shaw, Supt., Dept. of Public Welfare (1904)

A. B. Farnham, City Eng'r (1906)
REVERE
R. M. Copeland, Auditor
A. J. Brown, City Clerk
SALEM
Patrick J. Kelly, Supt. of Streets
SPRINGFIELD
E. T. Tifft, City Treasurer
STONEHAM
S. H. Green, Police Chief (1899)
TAUNTON
F. A. Leonard, Fire Chief (1901)
A. K. Crowell, City Eng'r (1904)
E. A. Tetlow, City Clerk
George A. King, Supt., Water-Works
WALPOLE
Katherine J. Higgins, Town Clerk and Accountant (1907)
WALTHAM
Geo. L. Johnson, Fire Chief
WEBSTER
J. E. Hickey, Town Clerk (1908)
WEYMOUTH
R. H. Whiting, Town Eng'r (1909)

Michigan

BATTLE CREEK
T. H. Thorne, City Clerk (1903)
W. W. Bridgen, Supt., Water-Works (1887)
W. P. Weeks, Fire Chief (1892)
BAY CITY
H. C. Thompson, City Engineer (1906)
BIG RAPIDS
Barney Laser, City Clerk (1903)
CHARLOTTE
Clayton E. Ballard, City Engineer & Supt., Water-Works (1900)
CLAYTON
Jesse A. Kuney, Village Clerk (1909)
CRYSTAL FALLS
Wm. J. Gribble, City Clerk (1907)
ELK RAPIDS
A. G. Maxwell, Village Clerk (1902)
FRANKFORT
B. W. Snider, Village Clerk (1892)
GROSSE POINT FARMS
John R. Kerby, Village Clerk (1909)
HART
W. H. McFarland, Village Clerk (1907)
ISHPEMING
Richard H. Olds, City Clerk (1909)
KALAMAZOO
Chas. H. Russell, Fire Chief (1909)
LANSING
Hugo R. Delfs, Fire Chief (1904)
LUDINGTON
Dean Thompson, City Clerk (1909)
H. L. Williams, Supt., Water-Works (1889)
MUSKEGON
Napoleon Belfy, Fire Chief (1896)
NORWAY
David W. Martin, Supt., Water-Works (1897)
ST. JOHN
Wm. Cochrane, City Clerk (1904)

Minnesota

EVELETH
Wm. Neilson, Fire Chief (1908)
HIBBING
Charles E. McIlhargey, Fire Chief (1909)
MINNEAPOLIS
Theo. Wirth, Park Supt. (1905)
ST. CLOUD
Joseph Seibert, Supt., Water-Works (1904)

Mississippi

COLUMBUS
James G. Ellis, Supt., Water-Works (1906)
JACKSON
J. H. Fewell, Supt., Water-Works (1903)
LAUREL
B. Frank Stolzfus, Supt., Water-Works (1903)

Missouri

HANNIBAL
A. M. Nipper, Supt., Water-Works (1903)
MOBERLY
J. E. Crews, Fire Chief (1907)
NEVADA
S. L. Higgins, City Clerk (1904)
SALEM
Harold Dailey, City Clerk (1904)

Montana

BILLINGS
Bert Talgo, Police Chief (1905)

Nebraska

HASTINGS
A. T. Bratton, City Clerk (1901)
Edward Mead, Fire Chief (1903)
GRAND ISLAND
Thomas M. Dillon, Fire Chief (1909)

New Hampshire

CLAREMONT
James S. Rice, Supt., Water-Works (1889)
CONCORD
Percy R. Sanders, Supt., Water-Works (1907)
William C. Green, Fire Chief (1894)
FRANKLIN
Harry E. Colby, Fire Chief (1908)
KEENE
Paul F. Babbige, Supt., Water-Works (1888)
LACONIA
Charles A. French, City Engineer (1906)
LEBANON
Allan B. Downs, Town Engineer (1890)
MANCHESTER
Michael J. Healy, Police Chief (1888)

New Jersey

ATLANTIC CITY
Lincoln Van Gilder, Supt. Water-Works (1906)
CLAYTON & GLASSBORO
Harry C. Shute, Borough Engineer (1898)
EAST ORANGE
Rosewell M. Roper, Supt., Water-Works (1905)
Lincoln E. Rowley, City Clerk (1907)
ELIZABETH
John J. McGrath, City Treasurer (1902)
August Gerstung, Fire Chief (1901)
GLEN RIDGE
John A. Brown, Borough Clerk (1895)
Patrick Higgins, Police Chief (1903)
HAMMONTON
W. Richard Seely, Town Clerk (1908)
IRVINGTON
I. J. Casey, Jr., Town Engineer (1909)
PASSAIC
R. H. Bowker, Fire Chief (1909)
PLEASANTVILLE
Nehemiah Andrews, City Clerk (1908)
TRENTON
Abram Swan, Commissioner (City Engineer, 1909)
Edward W. Lee, Commissioner (Comptroller, 1909)
Alvin Bugbee, Supt., Water-Works (1904)

New York

ELMIRA
John H. Espey, Fire Chief (1904)
NEWBURG
Charles B. Gilcrist, Supt., Water-Works (1907)
NEW YORK
John Kenlon, Fire Chief (1909)
NORTH TONAWANDA
John B. Batt, Supt., Water-Works (1901)
OGDENSBURG
David J. Crichton, City Clerk (1899)
OSSINING
James Bedell, Supt., Water-Works (1903)
PORT JERVIS
John F. Cleary, City Clerk (1902)
SALAMANCA
Geo. H. Elliot, City Clerk (1905)

North Carolina

HIGH POINT
A. B. Horny, Fire Chief (1901)
KINSTON
W. B. Coleman, City Clerk (1908)
RALEIGH
Ernest B. Bain, Supt., Water-Works (1899)
STATESVILLE
James D. Cochran, Supt., Water-Works (1899)
WILMINGTON
Chas. Schnibben, Fire Chief (1888)

North Dakota

BISMARCK
T. R. Atkinson, City Engineer (1907)

Ohio

AKRON
John T. Mertz, Fire Chief (1901)
BEREA
Frank M. Dorland, Supt., Water-Works (1900)
CANTON
Robert Mesnar, Fire Chief (1884)
L. B. Ohliger, Supt., Water-Works (1887)
CLEVELAND
George A. Wallace, Fire Chief (1901)
Robert Hoffman, City Eng'r
CONNEAUT
Lee Harvey, Supt., Water-Works (1900)
MT. VERNON
U. G. Pickard, Supt., Water-Works (1903)
NILES
Bert Holloway, Supt., Water-Works (1903)
SANDUSKY
Jacob Roth, Park Supt. (1897)
SIDNEY
George Hume, Fire Chief (1892)
Wm. O'Leary, Chief of Police (1893)
George A. Hatfield, Supt., Water-Works (1900)

Oregon

COTTAGE GROVE
G. B. Pitcher, Chief of Police (1905)
MARCHFIELD
John W. Butler, Recorder (1909)
McMINNVILLE
W. J. Brower, Supt., Water-Works (1907)

Pennsylvania

ALTOONA
J. N. Tillard, Chief of Police (1893)
ATHENS
R. J. Mulligan, Chief of Police (1891)
GREENVILLE
J. M. Hittle, City Clerk (1906)
LEIGHTON
John M. Beck, Fire Chief (1902)
MEADVILLE
Harry Ellsworth, Supt., Water-Works (1903)
NORRISTOWN
S. Cameron Corson, Borough Engineer (1899)
OIL CITY
A. G. Colby, Fire Chief (1905)
POTTSVILLE
G. A. Berner, City Clerk (1890)
ST. MARYS
Chas. P. Harvey, Borough Clerk (1908)
SCRANTON
Edward Eisele, City Controller (1905)
SHAMOKIN
T. C. Roberts, City Clerk (1902)
STEELTON
Oliver P. Baskin, Supt, Water-Works (1892)
WILKINSBURG
Charles F. Sperling, Borough Engineer (1897)
WINDBER
S. W. McMullen, Chief of Police (1903)

Rhode Island

CRANSTON
Wm. M. Lee, City Treasurer (1909)
WARREN
Charles W. Greene, Town Treasurer (1891)

South Carolina

CHARLESTON
Louis Behrens, Fire Chief (1907)
James H. Dingle, City Engineer (1894)
ORANGEBURG
Edward Hawes, City Engineer (1906)
UNION
D. D. Arthur, City Clerk and Treasurer (1897)

South Dakota

HURON
Carl Peterson, Supt., Water-Works (1898)

Tennessee

CHATTANOOGA
W. M. Toomey, Fire Chief (1905)
CLARKESVILLE
W. B. Young, City Recorder (1903)
J. E. Robinson, Chief of Police (1895)
NASHVILLE
J. W. Pentecast, Supt., Light Plant (1900)
W. W. Southgate, City Engineer (1901)
George Teyer, Supt., Water-Works (1882)

Texas

DUBLIN
W. P. Hallmark, Fire Chief (1905)

Vermont

BURLINGTON
Patrick J. Russell, Chief of Police (1896)
Carl D. Stockwell, Fire Chief (1904)
RUTLAND
Harry B. Whittier, City Clerk (1893)
Will L. Davis, City Treasurer (1895)
ST. ALBANS
John F. Mahoney, Chief of Police (1903)

Virginia

DANVILLE
Harry Wooding, Mayor (1892)
PULASKI
John T. Jackson, Supt., Water-Works (1890)
RICHMOND
W. H. Joynes, Fire Chief (1908)
Alfred H. McDonall, City Clerk (1887)

West Virginia

ELKINS
M. H. Brightbill, Fire Chief (1901)
HUNTINGTON
A. B. Maupin, City Engineer (1906)
KEYSER
F. G. Davis, Chief of Police (1905)

Wisconsin

APPLETON
George P. McGillan, Fire Chief (1901)
E. L. Williams, City Clerk (1904)
ASHLAND
W. T. Blair, Chief of Police (1907)
BARABOO
H. E. French, City Engineer (1904)
EAU CLAIR
James P. Welsh, Fire Chief (1906)
EVANSVILLE
Edwin S. Cary, Supt., Water-Works (1906)
LA CROSSE
J. B. Webber, Chief of Police (1907)
OSHKOSH
George H. Randall, City Engineer (1899)
RACINE
Col. Henry C. Baker, Chief of Police (1907)
SHEBOYGAN
C. U. Boley, City Engineer (1888)
WATERTOWN
Chas. Pieritz, Chief of Police (1907)
Chas. Mackay, Supt., Water-Works (1909)
WAUSAU
B. C. Gowen, City Engineer (1908)
Thomas Malone, Chief of Police (1902)
Frank F. Zielsdorf, Fire Chief (1909)

State Aid for Water-Works in New South Wales

By R. J. BARRETT
State Department of Public Works,
New South Wales

GEOGRAPHICALLY, New South Wales may be divided into four sections, and the water-supply problem of each section is essentially different. First, there is a narrow coastal belt which is well provided with rivers, and there is in general little difficulty for towns situated in this region to obtain adequate supplies. Second, there is the mountain region, where uninhabited catchment areas provide ample water of the highest degree of purity. Third, there is an inland basin, where the difficulty of obtaining satisfactory water is in many cases acute; such towns as are situated on the few important rivers have more or less assured supplies, but a number of inland towns are remote from these rivers, and can secure water only at a great expense. Fourth, there is that section of the inland area which is included in the artesian basin.

The Supply of Sydney

The city of Sydney, the capital of New South Wales and the largest city in the Commonwealth, is under the control of the Metropolitan Water Supply, Sewerage and Drainage Board; this body is also the constructing authority. Including the metropolis, the total population served is 1,455,000. The present source of supply is from three storage reservoirs on the Nepean watershed, namely, the Cataract, Cordeaux, and Avon, with an aggregate storage capacity of 88,343 million gallons, whence the water gravitates to the Prospect Service Reservoir and is then distributed to the various portions of the metropolitan area. Further impounding dams are in course of construction on the Nepean and Woronora Rivers. The extent of country within the Nepean River watershed which is utilized as catchment area for water-supply, and which was selected for the purpose over fifty years ago, covers 347 square miles. This district is singularly favorable to the construction of large works of storage at moderate cost. The streams run through narrow gorges, suitable for dam sites, with solid rock foundations at a shallow depth at points where the moderate fall in streams gives good storage capacity for the reservoirs formed. The supply is a soft, first-class, potable water and, apart from the purification effected by storage and subsequent screening, requires no treatment before passing into consumption.

Water-Supply for Newcastle

The city of Newcastle, the largest industrial center outside Sydney, is governed for water-supply purposes by the Hunter District Water Supply and Sewerage Board, an aggregate population of 197,000 being served thereby. The source of supply is a storage reservoir on the Chichester River, whence the water is conveyed by gravitation to the city. The total length of the pipe-line is 53 miles, of which approximately 9 miles is of continuous wood-stave pipe construction and 44 miles of steel, the diameter throughout being 36 inches.

Serving Smaller Communities

The country towns' supplies, after construction by the Public Works Department of New South Wales, are under the control of the various municipalities and shires, with the exception of the towns of Broken Hill and Junee, which are administered by the Department. In this regard it might be noted that, generally speaking, towns with a population of 3,000 persons or more are locally governed by municipal councils, whilst the rural areas are controlled by shire councils. These councils are composed of from six to fifteen members who are elected triennially by the constituents of the respective areas. Eighty schemes have been constructed and maintained in the country districts of New South Wales, including sixty-four supplies from surface waters, fourteen from underground flows, and two from artesian bores. Proposals are now under consideration for supply to twenty additional towns, and a number of augmentations are in hand.

Present Construction

At the present time the principal water-supply work receiving the attention of the Public Works Department is to supply seven towns which are located in the centers of important wheat-growing and grazing districts, representing a population of about 20,000, water being also available to the farm lands within the influence of the scheme for domestic and stock-watering purposes. The towns proposed to be served are Cootamundra, Stockinbingal, Temora, Barmedman, Wyalong, Murrumburrah and Young. The hand plan herewith, which roughly outlines the design, includes the town of Grenfell, but a local supply has been found more expedient and is now under construction.

The proposal is to draw from the Murrumbidgee River at Jugiong, sixteen miles southeast of Cootamundra, and the nearest and most suitable point on the river, for a supply to the towns in question. A site for a pumping-station has been determined to which the necessary power for pumping can be transmitted from the Burrinjuck Hydro-Electric station. The source of supply is assured by the flow of the Murrumbidgee River, which at its lowest record has exceeded 22,000,000 gallons per day. The maximum future requirement of the scheme is about 3,000,000 gallons per day, so that this proposal will absorb a very small part of the stream. The distribution system has been so designed that it will be capable of supplying adequate quantities of water throughout the entire district for domestic, commercial, railway and stock-watering purposes, as well as for fire extinguishment.

With the view of preventing excessive head on the pipes in the rising main near Jugiong, and possible trouble with the joints, the pumping will be in two stages, with an intermediate break pressure tank. The maximum head on each stage will be about 550 feet. The machinery at each station will be in three sets, electrically driven and of such a capacity that the three working together will pump 220,000 gallons per hour. This will supply the quantity allowed for future requirements when working sixteen hours per day, six days per week. The use of three units will permit of two-thirds of the power being available, with one set laid off for repairs. It is proposed to use turbine pumps direct-coupled to electric motors and automatically started and stopped by a water-level control.

The water will be pumped through a rising main of steel pipes 22 inches in diameter and 11½ miles long from Jugiong to the "settling tanks," which will be situated on a saddle in the Cowang Range at a level 1,703 feet above the sea and 840 feet above the river at Jugiong. A purification plant is to be placed at Jugiong, together with a plant for the de-aeration of the water. The water is lifted from the river by low-lift pumps into settling tanks, where it is treated for coagulant and, after settlement, gravitates through filters into a clear-water tank. From the latter it is lifted into service reservoirs at the Cowang Range—these reservoirs will each be of a capacity of 1,500,000 gallons—to be excavated and concrete-lined. From these service reservoirs the water will gravitate through two separate mains, one branch 44½ miles long, past Cootamundra and Stockinbingal to Temora, and thence a pipe-line 42 miles long will extend through Barmedman to Wyalong. The first 10 miles will be of steel pipes 16 inches in diameter by 5/16-inch thick, and the remainder of steel or cast iron, as is found to be the more economical. The main in the other direction will be 15 inches in diameter to Murrumburrah.

Between Murrumburrah and Young the lowest gap in the Black Range is about 1,785 feet above the sea, so that the water will not flow by gravitation from the settling tanks to Young, although the level of those tanks is high enough to enable the water to flow to Cootamundra, Temora and Wyalong with

ample pressure. In order to convey water over the Black Range, it is proposed to install a pumping-station at Demondrille at a level of 1,550 feet above sea-level. The machinery will be of similar type to that at Jugiong, but having a capacity of 20,000 gallons per hour. It will be electrically driven by power supplied from the Burrinjuck Station. The water for the Young extension will be pumped through a rising main 14 inches in diameter and 2¼ miles long, a height of 320 feet, to a balance tank on Wombat Hill, 1,870 feet above the sea. This tank will have a capacity of about 1,000,000 gallons, and will be excavated and concrete-lined. From Wombat Hill the water will flow by gravitation through a pipe-line of 14 inches diameter for 2½ miles and 12 inches for 10¼ miles.

Service reservoirs are proposed for the various towns included in the scheme. For Temora a reinforced concrete structure above ground has been adopted so as to afford a suitable head for the higher parts of the town, the relative levels necessitating this design. All the other reservoirs will be of the excavated and concrete-lined type, and of a capacity equal to three days' present requirements. Each of them is situated on an eminence from which an adequate pressure is given in the mains throughout each town.

Financing

The scheme is estimated to cost £1,339,540, including the distribution system of the towns. The whole of the works are to be financed by the State Government and the capital cost repaid over a period of forty years, which is the estimated service life of the major portion of the scheme. An annual instalment of £109,011 would be required in respect of a capital debt for the above-mentioned amount.

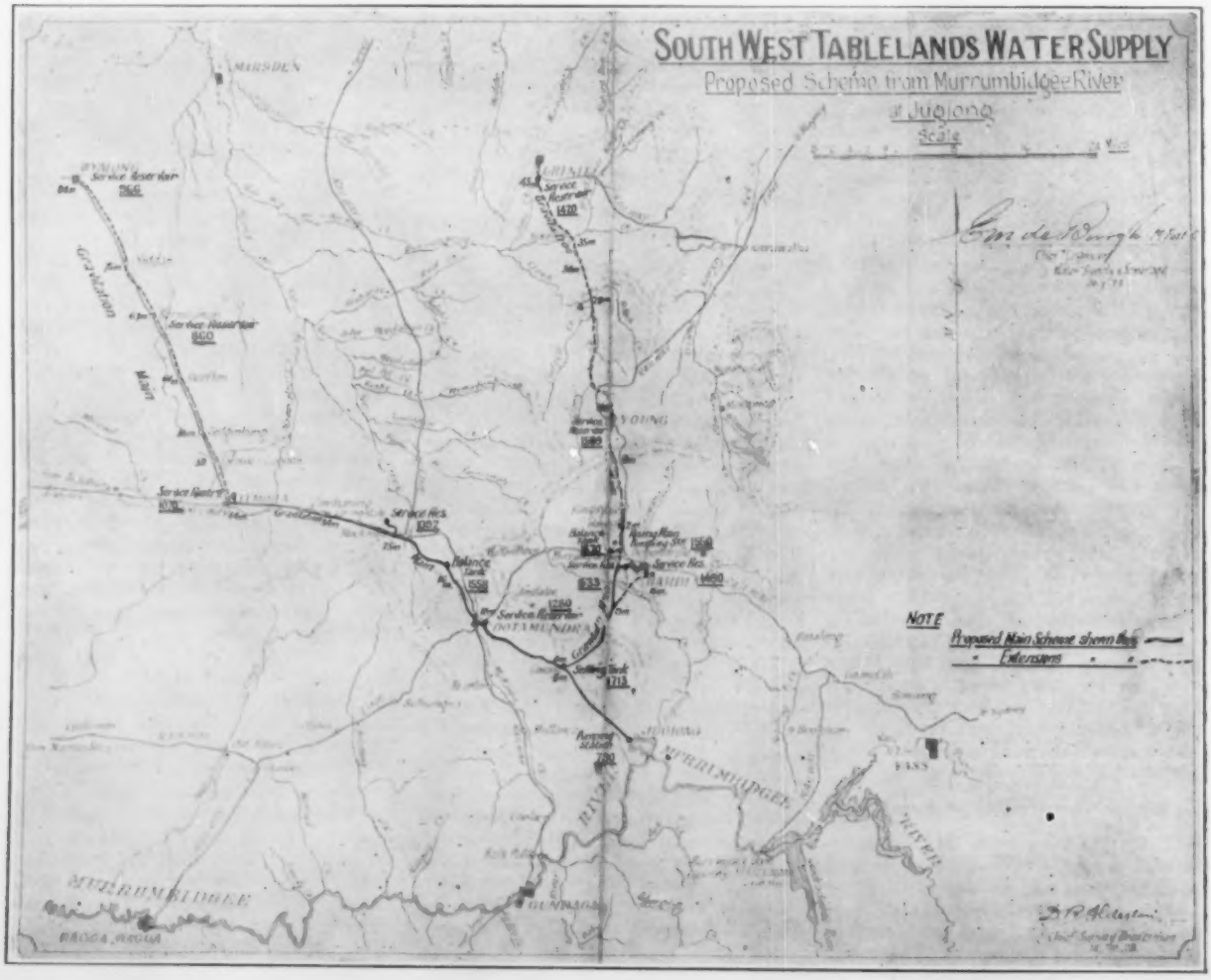
Administration

The administration of the "South West Tablelands Water Supply" is briefly to be on the following lines: the pumping-stations and main lines outside the municipalities will remain in the hands of the Public Works Department, whilst the branch mains and distribution system will be transferred to the Councils for administration and collection of revenue, the Department providing water by measure to the Councils and the Railways. It might be mentioned that it is the practice in New South Wales to obtain the revenue necessary to finance water-supply services by means of a water-rate on the property within the distribution area. It is proposed to install house meters throughout, in view of the comparatively high cost of the water, and charges will be made for water used in excess of the quantity allowed in respect of the rate. The estimated total cost to the consumers will range from 3/6d. to 4/2d. per 1,000 gallons; the charge made by the Department on account of the headworks will be 3/- per 1,000, and the local works represent a varying charge of from 6d. to ½d. according to the cost of the reticulation system, etc.

In conclusion it might be stated that the established policy of the New South Wales Government is to assist local development by enabling councils, by financial assistance and expert advice, to provide water-supply (and sewerage) services. The Government is appreciative of the indirect benefit to the state generally in enhancing the value of both town and country lands, and in increasing the means of production.

Regular Departments to Be Resumed Next Month

Because of the special character of this twenty-first anniversary number, certain regular features of the magazine have been omitted from the present issue. These important monthly departments—Airports and Aviation, by Archibald Black; The Taxpayer's Dollar, by A. E. Buck; Zoning and Planning Notes, by Frank B. Williams; and The Month in Public Health, by James A. Tobey—will be resumed with the October number.



Zoning Against Oil Wells

Advancing Derricks Bring Puzzling Problems to Oklahoma City, Okla.

By MORRIS P. MOORE

KEEPING oil wells outside the business and finer residence districts of Oklahoma City is proving a serious test of the police powers of the municipality. The fight is built around the passage of zoning ordinances. A zone in which oil drilling is permitted has been created, and as the field advances closer into the built-up districts, applications for extensions to this zone come thick and fast.

As a result of the advance of the derricks, city officials, while "pointing with pride" to the field in the city's back yard worth millions to the city, also are beginning to "view with alarm" the onward march toward the business district, with its resultant fire danger.

Wells already are drilling inside the city limits. An application to increase the fire insurance rates $1 per $100 is pending before state insurance officials. The city is fighting with all its power this proposed fire insurance rate.

The City's Duty

Even now, wells are drilling within a mile and a half of the city hall, and locations have been made for others within a mile of the mayor's desk. Oilfield noise vies with the traffic's roar, and wells may be seen shooting their black oil spray over the derrick tops from windows of downtown office buildings, so close has come the oil development.

The trend, some geologists say is, for the field to extend right up to the business district, and there the heaviest production may be encountered, if it is ever drilled. It is the city's duty to stop this, because of fire hazard, ruination of property and detriment to the city.

This difficult duty rests mainly on the shoulders of E. M. Fry, City Manager; Malcolm W. McKenzie, Municipal Counselor; Mayor Walter C. Dean; the City Council; and Longstreet Hull and Bliss Kelly, Assistant Municipal Counselors. It is Mr. Kelly to whom, as Secretary of the Planning Commission and Board of Adjustment, much credit goes for the present zoning laws.

Their problem is to protect the entire city and at the same time to allow citizens in one section to realize on their black gold, beneath front yards and garden spots. Just where to draw the line, between menacing an entire city of 184,000 persons, and allowing citizens in another district to get their share of their rightful possession, is a task that means much midnight oil at the City Hall, long hours in court, and the advice of the best attorneys and city planners of the United States.

The city's oil zoning ordinances thus far have been upheld in the courts, although in specific instances certain changes have been ordered by the court and drilling has been allowed where city officials fought it. In addition to the ordinance creating the oil zone, just as if it were a business zone or an apartment house zone, the city has been called upon to enact ordinances regulating the drilling inside the city, setting out precautions and safety measures to be exercised. Five oil-well inspectors are on the city payroll, and others may be appointed.

Thirty permits for wells inside the city have been issued. Property owners a mile or more from the drilling area are crying for the right to drill, but the city is holding the zone in check as much as possible, extending it only as producing wells prove the oil locations closer in.

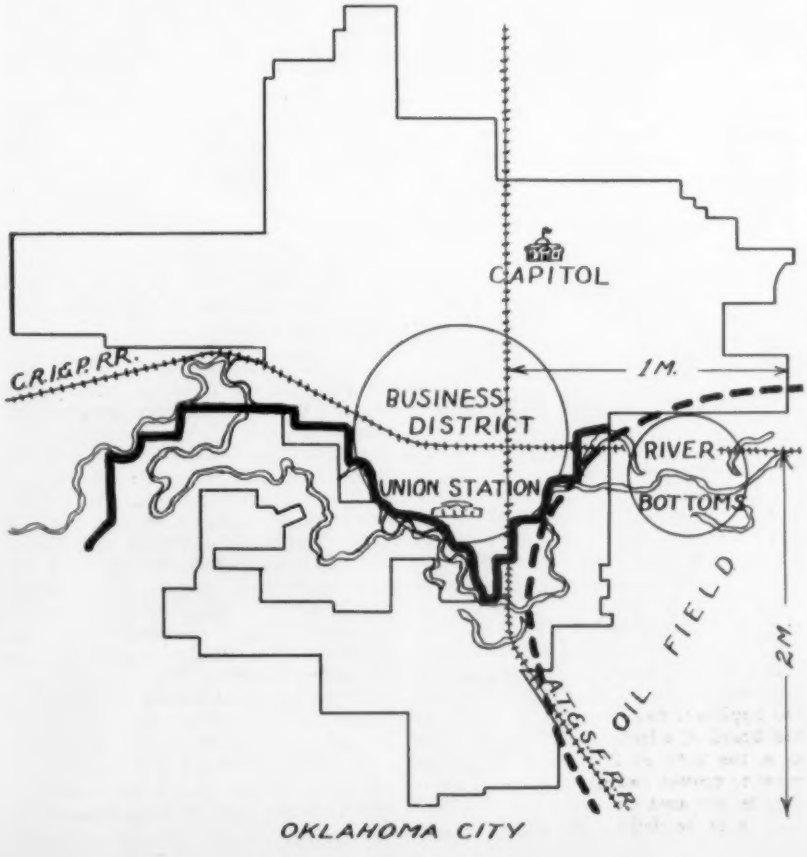
The Onward Move of the Oil Field

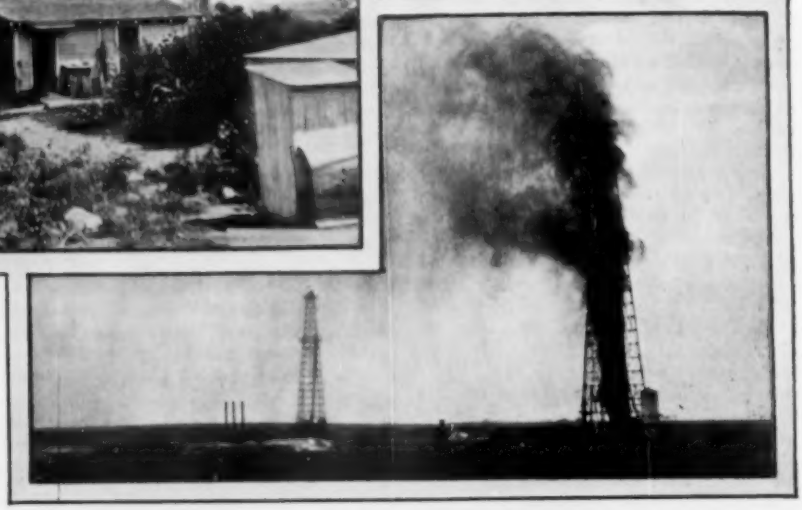
From eight miles southeast of the business district, the oil field has moved steadily toward the towering tops of office buildings. Larger production, and therefore the fiercer fight to drill, have been found in the north end of the field. As the derricks have crept across the city limits, many residents, lease-money in their pockets, have vacated. Others, however, are trying to live in the noise and dirt of the oil field, as wells grind down toward the pay horizon. At the same time the field also has advanced straight north, and now is touching the city limits on the east, two miles east of the business districts. The skyline on one side is a row of tall office spires; on the other, a forest of steel derricks pointing up. Between the two, residents are trying to live quietly, or get a well in their own backyard.

A wide expanse of sandy river bottom, subject to overflow, separates the business district from the southern residence district. This property, almost worthless for any other purpose, lends itself to oil development. The city's dump-ground, in the middle of the river bottom, has been leased and a well is going down. Wells are drilling through the river bed, and the school board has leased school grounds. Many schools, if open at all this fall, will vie with the roar of oil rotaries, just outside the window.

Citizens have filed suit even to recover property now marked off as streets, in sparsely settled additions to the city, on the grounds that the city has never claimed the streets by improving them, and that the property should revert to the original owners. It is but one angle of the tremendous test to which Counselor McKenzie's office is being put, and the end is not yet in sight.

On the other hand, oil has been good to the city government. City-owned Tros-





BACK-YARD ADORNMENTS

The illustration at the left shows a section of southern Oklahoma City, less than a mile away from the business district, where drilling has been permitted by ordinance

(Below) Wild Mary Sudik for 12 days defied all efforts at control, spraying oil for a distance of a mile, and oil-splashing window-panes 15 miles away

per Park, where Boy Scouts once had a camp in the forest, where a golf course zigzagged its way through the oaks and over the fields, is now an oil field. Derricks stand on the greens and fairways. The city already has more than $150,000 in the treasury from oil royalty from 24 producing wells in Trosper Park, and others are drilling on down to the pay. Other city parks have been leased. The Trosper family, who sold the park land to the city years ago, have brought suit for its recovery. The 640 acres now are very valuable.

The Farm in the Heart of the City

The most serious test of the zoning ordinances yet encountered will come up in federal court in the next few weeks. A tract of 104 acres owned since Oklahoma was opened to settlement by W. F. Harn, has never been platted and opened for residence development. Corn and cotton rows still may be seen on the farm in the heart of the city. The tract, outside the city limits until last fall, is completely surrounded by residence districts. Within 200 feet on one side are the grounds of the State Capitol Building. Across a wide boulevard dotted with flowers and shrubs is Lincoln Terrace, an addition fitted with high-priced residences, the finest new subdivision in the city. On another side is a residence area closely built up, and on a fourth side is a railroad right-of-way, and farther on, more homes.

The oil company seeking permission to drill, charges the land was brought into the city limits for but one purpose, and that to prevent oil development, although the lease was signed before it was made a part of the city. To protect the lease, a well must be drilled before October 15. The company take the position that the ordinances are invalid and that it should be allowed to drill on this farm land if other companies are allowed to drill in built-up sections by tearing out houses to make room on which to erect a derrick.

The tract is a mile and a half north of the present edge of the oil field. When the lease-holder sought permission through the city authorities to drill, a storm of protest against the oil development there arose from owners of the $100,000 homes nearby. They feared a well would come in wild, like the Mary Sudik of national fame, and bathe their estates in black oil. They did not want the quiet of their gardens and front lawns invaded by the thunderous roar of a dozen wells just across the street. The suit will come to trial before fall, on application for an injunction to prevent the city from interfering with the operations. Lawyers are convinced it is a serious attack on the city's zoning regulations, and it is likely that it will go to the United States Supreme Court before being finally settled.

The zoning ordinance which creates the U-7 or drilling zone provides for the issuance of a drilling permit by the superintendent of buildings, just as any other building permit is issued.

How the Oil Zoning Ordinance Operates

The ordinance further sets out that in no case will a permit be issued for a well on unplatted ground if the applicant company does not hold a leased block of at least 5 acres; and in no case will one be issued on platted land on a block of less than 2½ acres. In case an oil company has a lease on more than 51 per cent but not all of the proposed drilling block, upon being denied a permit by the building superintendent, the applicant has the right of appeal to the board of adjustment. In such cases it is the duty of the board of adjustment to protect owners of property adjacent to the area on which the proposed well is to be drilled, by attaching this adjacent property to the community lease, or to another, ordering that the owners share in the royalty in the same proportion that their property holds to the entire tract. In this way, all property gets its share of oil, and is not left out in "corners" of drilling blocks.

The city's principal fight now is to resist the proposed increase in fire insurance rates, and the injunction suits by oil companies seeking to drill closer in than the U-7 zone limits, as the field is proved in its gradual advance on the business district. Another three months will tell. It takes that long to drill a well.

NEW COURSES FOR THE SOUTHERN CALIFORNIA SCHOOL OF PUBLIC ADMINISTRATION

EVENING classes dealing with public relations, city building codes, public building management, office management, and elements of reinforced concrete (the last for architects only) have been added to the 1930 fall program of the School of Public Administration of the University of Southern California, in Los Angeles. The School of Public Administration was established in 1929 to meet the need for training in government, which in the last fifty years has been largely neglected in favor of almost every other profession. The University offers degrees in public administration and the professional degree of Master of Science in Public Administration. Each spring an intensive institute in public administration is held for officials and employees of towns too distant from educational centers to make regular attendance feasible.

What Is Sewage Treatment and Why Is It Necessary?—Part I.

By FRANK C. ROE
Shields, Jordan & Roe, Chicago

WE are all aware that the destruction of beauty and natural resources, the pollution of streams and rivers, and the encouragement of the ravages of disease, is undesirable and likewise unintentional. In many cases, the realization that such undesirable conditions are approaching, if not already prevalent, is lacking, even on the part of community officials. With the eventual abolition of these objectionable conditions in mind, it is the writer's wish to point out the development in the science of caring for human wastes (particularly the present-day methods) as a means of educating the uninformed as to what improvements can and should be made, and how to make them.

It is also desirable to reach another group of people which is smaller than the group of uninformed already mentioned, namely, those people who are repulsed by, or who immediately turn away from, what they consider an unwholesome subject. Sewage treatment has developed to such a degree that the era of offensive odors enveloping an unpleasant-looking and uncared-for plant, has given way to an era of esthetically constructed, odorless treatment plants, and landscaped grounds, that are showplaces of the community.

The average citizen, in the past, gave little thought to his waste, following the immediate disposal of it in his home. The care of his waste was a service taken for granted, and what the ultimate disposal might be, gave him no concern. He knew, perhaps, that a system of underground pipes was necessary to carry the wastes away, but just where and how far they were carried and what eventually became of them, often remained a mystery.

Education in This Subject

Today, many civic organizations such as Rotary, Kiwanis and Lions Clubs, Municipal Leagues, Chambers of Commerce, and notably the Izaac Walton League, are making an effort to educate the community in this great sanitary question, or so-called "unwholesome subject." Other factors are aiding education, foremost among which, because of their authority and ability to persist, are the Health Departments of our states. Their work is thorough, to the point, and commendable in all respects. After making complete surveys, which are the result of complaints or are based upon their own suspicion of conditions, they notify the community authorities of unsanitary conditions that exist. In some states the notification is in the form of an order to proceed with the construction of necessary treatment works or other approved relief measures. In other states the form of notice varies in degree of action required (depending upon authority), down to a mere suggestion that conditions should be improved.

In many instances the community officials are at a loss as to how the citizens may be made to realize what is before them and, subsequently, how to have them vote for the necessary measures to finance a project. Here is where the Izaac Walton League, Kiwanis Club, etc., may provide an important service to the community by disseminating knowledge of the subject and by pointing out and fostering a relief of the situation.

Another way in which the general public becomes acquainted with conditions is through the not infrequent suits for damages brought against the community by riparian owners on the stream into which the sewage is discharged. Innumerable serious cases of cattle becoming diseased where their pastures adjoin polluted streams, have been recorded. It is inevitable that the cattle will drink from the polluted streams even though pure water is available. Does not this fact create a forbidding picture in the mind of anyone who is apt to consume the meat or drink the milk of the animals so made subject to disease?

In addition to the above factors, the Izaac Walton League and the Gorgas Memorial Society carry on independent investigations of their own which possess a most potent power in education. The Izaak Walton League is interested primarily in the protection and development of our fish and game, which rapidly become extinct in and about polluted waters. The Gorgas Memorial Institute of Tropical and Preventive Medicine is interested in the abatement of the mosquito nuisance. Since polluted waters provide most excellent breeding-places for mosquitoes (which are ready carriers of disease), this is another important reason for effecting stream and lake purification as far as possible.

THE WELL-DESIGNED PLANT FOR SEWAGE TREATMENT AT SIOUX FALLS, S. DAK.

Definitions

In describing the development of this comparatively new science called "sewage treatment," there are some fundamental terms which must necessarily be used and which should be defined so that their meaning is clear to the average layman.

Sewage, technically modified by the adjectives "sanitary" or "domestic," is the water-carried waste from water-closets, laundry tubs and kitchen sinks, in residences, hotels, business buildings, and institutions. The term "sewage" is very often confused with sewerage, which has a decidedly different meaning.

Sewerage comprises the sewer system, pumping-station, treatment works, and all other works necessary to the complete collection, treatment and disposal of the sewage.

Screenings are all solids retained on screens which are usually located where the sewers enter a sewage treatment plant or pumping-station. A large part of such screenings is made up of floating material (wood, cans, orange peels, etc.)

Grit is the heavy mineral matter contained in sewage, such as sand, gravel, cinders, etc.

Sludge is the term given to the organic solids which settle out or are removed from the sewage by other means, following screening and grit removal, and which are mixed with more or less water to form a semi-liquid mass.

Sewage Is Not Purified

Lastly, to correct an erroneous impression that sometimes exists, let it be said that sewage is *treated* usually, and *not purified* in the true sense of the word. One of the many tests of a treated sewage, called the stability test, has its results expressed in percentage of purification, although 100 per cent purification does not remove all germs and bacteria. This would not be necessary unless the treated sewage were to be used, undiluted, for a water-supply.

History

The earliest written record of any attempt at sanitation as applied to the disposal of human wastes is to be noted in the twenty-third chapter of Deuteronomy. This, obviously, was in the form of dry disposal, which has been continued in sparsely populated districts, with more or less undesirable conditions and danger of disease, to the present day.

Just recently there have been unearthed the ruins of a city, more than 5,000 years old, which was called Mohenjo-doro and was located on the west bank of the Indus river about 1,500 miles from Babylon. Many of the buildings had bathrooms with human waste receptacles or latrines set in their walls, connected by drains to brick sewers in the streets. The sewers were well constructed with arched top and were laid on an even gradient.[1] Water was supplied to the houses by chutes cut in the outer walls.

The Roman Empire was probably the first government in history acknowledging that sewage might be cared for as water-carried waste and removed by sewers. However, they restricted the use of the sewers and were concerned with the maintenance, as evidenced in Frontinus' "Water Supply of Rome," in which he quotes an ordinance of the Roman Senate published in the name of the Emperor. This was enacted about A. D. 80 and states, "I desire that nobody shall conduct away any excess water without having received my permission or that of my representatives, for it is necessary that part of the supply flowing from the delivery tanks shall be utilized not only for cleaning our city, but also for flushing the sewers." Thus it appears that human wastes were deposited in the street gutters or directly into the sewers and removed by flushing.

With the fall of the Roman Empire an era began during which pestilence and disease swept the earth. It cannot but be evident to any thinking person that only unsanitary conditions could bring about the countless plagues of the Middle Ages. Paris finally constructed sewers, in 1663, but they, too, were primarily for storm water and were poorly cared for. Victor Hugo, in one of his countless descriptive digressions from the plot of "Les Miserables," pictures the sewers of Paris at a later date. He states that the bottoms of the sewers had fallen into disrepair and were filled to the depth of a man's height with black, oozy muck and slime—what we term sludge today. It was not until the nineteenth century that any real progress in the disposal of human excreta was made in France.

London began to empty domestic sewage into its sewers in the year 1815. This deed became compulsory by 1847, following a report made in 1844 of the Health of Towns Commission, which pointed out unsanitary conditions. The first system of sewers on the European continent was constructed in Hamburg in 1842. The first real system in the United States was constructed in Chicago in 1855, although numerous storm-water drains had previously been built; one in Boston dating back to the Seventeenth Century. Construction of comprehensive sewer systems in every large city followed, Baltimore being the last to fall in line, early in the twentieth century. As a result, the drop in typhoid fever death-rates was astounding[2], and the communities thought a good work had been accomplished and a great menace to civilization removed.

The Construction of Sewers Merely Centralizes the Disposal Problem

The general satisfaction following sewer construction was short-lived, since the problem of ultimate disposal was merely shifted from the individual to the community. In other words, unsanitary conditions surrounding the dwellings were removed, but at some point on the outskirts of the city the concentrated filth from the entire population was delivered, to be taken care of by municipal authorities. The problem was rendered all the more difficult by the large quantity of water which carried this filth through the sewers to the point of discharge.

Probably the first realization of this shifting of unsanitary conditions was in London in 1858 (which is logical, since London, as previously stated, was the first large city to use the sewers for water-carried human excreta). The concentration of large quantities of sewage and sludge in the Thames River created a national humiliation, described by Dr. Budd, a foreign writer, as follows: "For the first time in the history of man, the sewage of nearly three millions of people had been brought to seethe and ferment under a burning sun in one vast open cloaca[3] lying in their midst. The result we all know. Stench so foul we may well believe had never before ascended to pollute this lower air. Never before at least had a stink risen to the height of an historic event."

Sewage Treatment Begins

The newer phase of this problem, which we now call "sewage treatment," began to be met steadily and with increasing success by means of intensive study and extensive experiments. Up to the present day, however, only a small percentage of the communities of the world have availed themselves of the new science and have constructed treatment works of any kind to prevent pollution of their watercourses. In Illinois, which is one of the leading states in the number of treatment plants constructed, about 60 per cent of the communities of over 1,000 population still discharge raw, untreated sewage into the various streams. Definite data are not available for the remainder of the United States, but it would be safe to assert that 65 or 70 per cent of all places of over 1,000 population are discharging raw sewage into the ocean, lakes or rivers.

(*To be concluded in October*)

[1] Gradient—the slope or inclination of a sewer towards its outlet.

[2] No precise and comprehensive data are available previous to 1910, but it is known that death-rates of more than 100 per 100,000 population existed generally throughout the world. In 1910 the average death-rate in all cities of the United States of over 100,000 population had dropped to 20 per 100,000, and in 1927 the rate was less than 2 per 100,000; the last drop being due to sewage treatment and water purification.

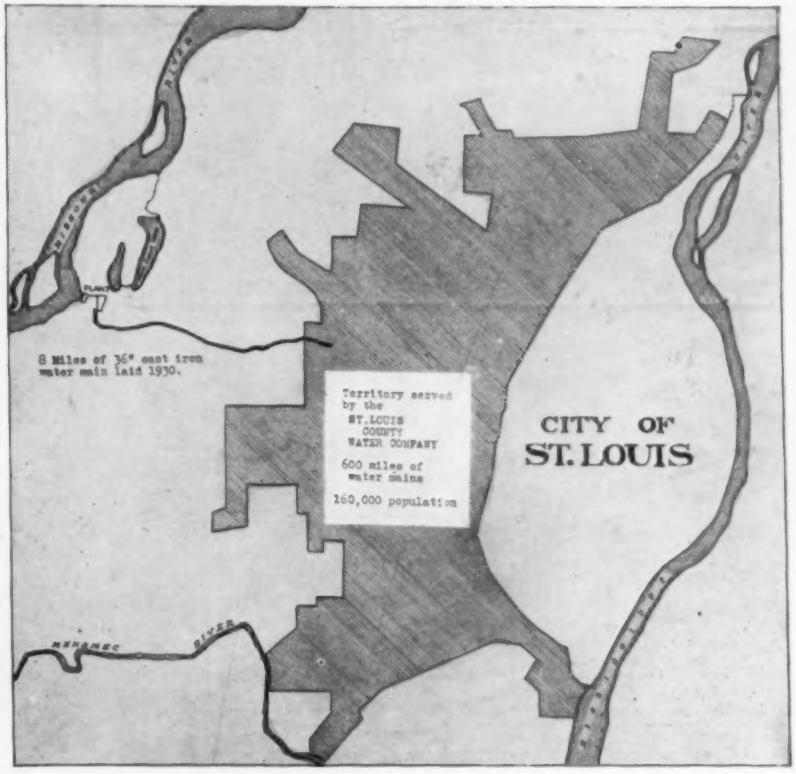
[3] Cloaca—a sewer.

A SEWAGE TREATMENT PLANT IN THE SUB-TROPICS

The plant at Lakeland, Fla., with Dorr digesters in the background

Day Labor Lays 8 Miles of 36-Inch Pipe for Water Company

By W. V. WEIR
Assistant Manager,
St. Louis County Water Co.,
St. Louis, Mo.


8 Miles of 36" cast iron water main laid 1930.
Territory served by the ST. LOUIS COUNTY WATER COMPANY
600 miles of water mains
160,000 population
CITY OF ST. LOUIS
MERRIMAC RIVER

THE installation of 8 miles of 36-inch cast iron water-main in St. Louis County, Missouri, was completed on May 31, 1930. This line enabled the St. Louis County Water Co. to deliver sufficient water from its plant to the distribution system in time to meet this summer's demands. Additional carrying capacity has been furnished to meet the water demands for from ten to fifteen years in the future.

The St. Louis County Water Co. supplies water to all the suburbs, with one exception, of the city of St. Louis. All water consumers in Ferguson, Jennings, Riverview Gardens, Wellston, Pine Lawn, Normandy, Bridgeton, University City, Clayton, Olivette, Overland, Ladue, McNight, Deer Creek, Richmond Heights, Brentwood, Maplewood, Shrewsbury, Glendale, Oakland, Affton, South Carondelet and Luxemburg are supplied directly from the mains of the company. The city of Webster Groves owns its own distribution system and supplies over 4,500 taps with water obtained through two large metered connections from the mains of the St. Louis County Water Co. Considering the city of Webster Groves as one consumer, there are now 32,500 accounts receiving water. Among these are quite a number of large golf courses, swimming pools and truck farms, which cause a high warm-weather demand.

The distribution system, which at one time reached out to each of the above communities with finger-like supply lines, has grown together to form a grid system completely surrounding the city of St. Louis to the north, west and south. The area covered is twice the size of the city. Five hundred and eighty-five miles of water-mains from 2 to 20 inches in diameter comprise the distributing mains.

The plant supplying this system was located on Howard's Bend on the Missouri River in 1902. Recently the city of St. Louis has built a new plant a half-mile upstream from the plant of the county system.

Earlier Construction

In 1903 the first supply main, a 12-inch cast iron line, was laid from the plant to Olive Street Road, and thence eastwardly along this road to the distribution system, a total distance of 8 miles. In 1908 a second 12-inch line was laid paralleling the first. In 1910 the second line was replaced with a 20-inch cast iron line. In 1921 the first line was replaced with a 24-inch cast iron line. These two mains lie on the north side of the road, while the recently installed 36-inch main lies 15 feet north of the south line of Olive Street Road.

In 1915 a 10-million-gallon reservoir was constructed at Stratmann, about a quarter of a mile from the discharge end of these supply mains. Two electric centrifugal pumps are connected to pump either from the supply mains or from the reservoir around check valves in the supply mains and thence to the distribution system. These pumps can boost the pressure on the distribution system during periods of maximum demand and by pumping from the reservoir can act as an emergency supply for short periods while the plant may be partially or totally shut down.

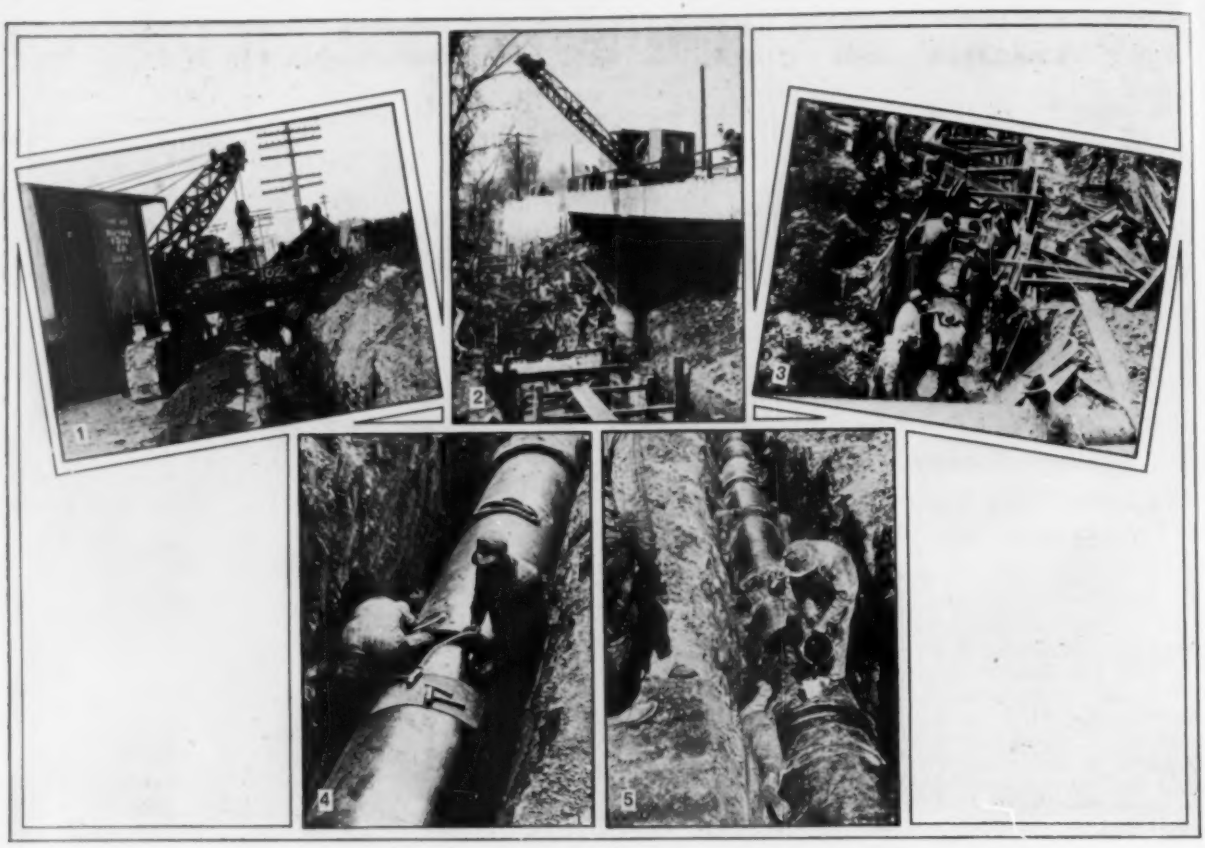
New Line Quickly Showed Its Value

The water delivered to consumers in the summer of 1929 reached a peak day of slightly over 15 million gallons. Since the new supply line was completed, over 18¼ milion gallons were delivered to consumers on the peak day in June, while over 21 million gallons were delivered on the peak day in July. The pump head at this time was reduced from 170 pounds per square inch to 135 pounds per square inch at the plant. Practically no drawdown was experienced in the Stratmann reservoir, while the drawdown was serious in 1929.

Pipe Laying Started with Hand Work

A permit for the construction of the 36-inch main was applied for on January 2, 1930, at which time materials were ordered. The pipe and fittings came in from the first of February to the end of March. The laying of pipe from the plant to Olive Street Road was started by a small crew in the latter part of February. Three weeks were required to lay a half-mile of pipe up a bluff road, digging by hand and laying pipe with a tripod derrick. Quite a bit of solid rock was encountered. The laying of pipe on Olive Street Road was not started until March 17, when the necessary permit was forthcoming from the St. Louis County Court.

The pipe and fittings were supplied by the United States Cast Iron Pipe & Foundry Co. The pipe known as "Hi-Tensile" pipe was furnished for 200-foot, 300-foot and 400-foot heads. The head on this main varied from 170 pounds per square inch at the plant to 50 pounds where it connected with the distribution system.



PROGRESSIVE PHOTOGRAPHS OF LAYING OF 36-INCH PIPE

1. Laying the 102nd pipe in a 9-hour day on Olive Street Road, St. Louis. A drag-shovel is shown digging the trench in the background, using a 25-foot stub boom because of the low telephone wires. 2. Lowering a section of pipe into Coleman Creek, encountering mud and quicksand. 3. Homing a 400-foot head cast iron pipe into a creek crossing. The creek was dammed above and below the trench and the flow handled by two 16-inch diameter steel pipes in the foreground. 4. Yarning a 36-inch joint with square braided flax packing. 5. Pouring a 36-inch joint with Leadite. The next joint ahead is being warmed with a kerosene torch, and the second joint ahead is being yarned

The two lighter weights were made with single groove in the bell, while the 400-foot head pipe had double grooves.

Eleven 36-inch hub end valves were placed at intervals along the main, while one was used on a lead into the reservoir grounds at the booster station. These were horizontal valves with 6-inch by-passes and bevel gears. A check-valve was placed in the line at the booster station to prevent back flow at times when the booster pumps are in operation. This check-valve was also fitted with hub ends and was made up of seven multiple ports in a vertical plate. The valves were furnished by the Rensselaer Valve Co.

Cross Connections Permit Isolating Any One of Three Mains

Two 24-inch, one 20-inch, and six 16-inch by-passes were made between the new line and the existing 24-inch main. The 24-inch main had been in turn by-passed to the 20-inch main, so that now a section can be isolated from any of the three mains without crippling the supply. The three larger connections were cut into the 24-inch main with tees and sleeves. The six 16-inch connections were made by tapping through 16-inch tapping valves attached to the 24-inch main with bolted sleeves. The tapping sleeves and valves were furnished by the A. P. Smith Manufacturing Co.

Handling the Pipe

Two 3-ton trucks with long wheelbases were purchased for pipe hauling, and were later equipped with dump platform bodies for use in dirt and rock hauling and for other general work. For the pipe-hauling job these trucks were fitted with two 8 x 8 timber bolsters, each truck carrying two pipe per trip. A third company-owned 2-ton truck hauled pipe part of the time. Since the haul ranged from two to eighteen miles per trip, six-cylinder, high-speed trucks with dual transmissions and pneumatic tires were purchased. These trucks averaged over 200 miles per day in delivering the pipe, which was snubbed off to the north side of the road on timber skids.

The crane operator and one man to hook pipe at the switch, three drivers and two snubbers on the road formed the pipe crew. Over 3,400 pieces of pipe and fittings were delivered in 60 days by this crew without paying demurrage on a single car, though as many as 12 cars of 15 pipe each were often switched in at a time. At such times the pipe was stacked on the ground, and later loaded on trucks. The cost of hauling was found to be so far below the figure at which a contractor would have undertaken the job, that both new trucks could have been charged to this job and completely paid for, still leaving a substantial saving.

For unloading the pipe from cars at the switch, a 10-ton Bucyrus-Erie 1030 gas crane was purchased, equipped with a 35-foot boom. This machine was later used on the road to place pipe and valves in the trench. For work on the trench the outer 15-foot section of the boom was removed and replaced with a 5-foot tip, making a 25-foot length. This short boom was required, as the crane often had to work under the low wires of a country telephone system with a flat boom.

Trench Digging

A 1030 Bucyrus-Erie drag-shovel was rented to dig the trench. This type of machine was selected because of the character of the road upon which the work was done. A large portion of the trench was dug in or beyond the shoulder of the macadam pavement. In such places the drag-shovel prepared its own road by filling the ditch or by cutting down the bank.

Two ten-hour shifts were made by the excavator. From 300 to 500 lineal feet were opened each shift. Two light plants furnished light at night. A 750-

watt plant mounted on the drag-shovel furnished light for the operator, and a 1,500-watt plant on a steel truck furnished light for the general work. Both plants were 115-volt direct-lighting units. The first mile and a half of the main on Olive Street Road was laid to an established grade to which the road will be graded in the future. This necessitated cutting a trench approximately 4½ feet wide from 6 to 10 feet deep. The remainder of the pipe was laid to obtain a 3½-foot cover, necessitating a trench 4½ feet wide by 7 feet deep. Two men worked immediately behind the drag-shovel, bottoming the trench and trimming the sides. The dirt was shoveled forward and removed by the machine. A carpenter followed the bottom men, placing vertical 2 x 10's on each side, held by two 4 x 4 braces. Bracing was spaced at 12-foot intervals.

Shallow bell holes were dug immediately preceding the pipe layers. The pipe was picked up from the north side of the road and swung into the trench by the crane, which traveled just south of the center line of the road, leaving the north side open for traffic at all times.

Pouring the Joints

Leadite joints were poured against ⅝-inch square braided hemp packing, at least three joints behind the laying gang. Some trouble with leaking joints was experienced in the first mile of pipe laid. The following procedure was then established, which corrected the trouble entirely. The hemp was driven with hammers as far back as possible. The bell was then heated for three to five minutes with a kerosene torch. The hemp was then driven back again with a hammer and the joint poured immediately.

Backfilling

By the order of the Court, "the first backfill had to be settled by flooding, the top 18 inches then being placed dry and tamped with a mechanical tamper." The first filling was done with a Fordson tractor equipped with a side double-drum winch and a 25-foot pipe boom. Two days after the flushing had been done, the rest of the ditch was filled and tamped with a Cleveland backfiller tamper. After standing from four to six weeks, the top 6 inches of the trench was removed and replaced with crusher-run macadam and topped with screenings.

A Record Job

The entire job was completed by the St. Louis County Water Co. without obtaining extra help other than labor. After Olive Street Road was reached, 7½ miles of pipe with by-pass connections were laid in nine weeks. The largest number of pipe laid in a nine-hour day was 102 lengths, while 101 and 97 pieces were laid on two consecutive days. No pipe laying was done on Sunday because of excessive traffic conditions. The work was carried out at the orders of W. H. Henby, President and Manager of the company, and under the writer's supervision.

What Is Essential to a County Highway Program?

By **E. L. GATES**

Superintendent of Highways, DuPage County, Ill.

A GREAT variety of conditions directly and indirectly affect the proper shaping of a county highway program. A county may be adjacent to a large city, or there may be one large city within the county, which would distinctly alter the traffic and call for a construction program entirely different from one for a county situated some distance from a large center. The physical conditions of the county would also greatly influence its highway program.

Perhaps the ability to raise funds for roads would be next in importance, for it takes money to carry out a program. A well-defined plan, however, can still be made up and thus establish an ideal, even before enough money is available to complete the program. In planning county highways, it is necessary to watch the financial side of the question, the same as in any other business.

A definite idea of the needs of a locality and the funds available is all that is needed to start a program, and no matter where the county is, or how much money is available, there should be a well-defined road program if the county expects ever to have good roads.

County Highway Maps

A well-made, complete map showing the location and names of all roads, bridges and large culverts, is essential. These maps should also show the type of road as well as the kind of bridge.

In DuPage County we make our maps on a scale of 100 feet to 1 inch and put one quarter-section on each sheet. On the map, buildings are located approximately. We have found these maps to be of the greatest assistance, not only to the road department, but to the county as a whole, because they are also used for assessment purposes. Subdividers are required to bring in their subdivision plats on the same scale. In this way it is possible to check easily and quickly to see that the roads meet each other and do not leave jogs and dead ends. In locating a new road, it can be plotted on these maps, and, as the buildings, large streams and railroads are also shown, the map readily indicates what must be done to open up the road. The owners' names are also shown, so that it is known immediately with whom the county highway department must deal.

Surprising mistakes are discovered when it is attempted to plat a whole county according to available records. It is surprising also to find that some property has not been assessed at all, and that other property has been assessed more than once. When it comes to road assessments, this means a great deal, for the county needs all the money it can get for road improvements. In planning a state road, the State Highway Department has sent engineers to our offices to get records from these maps. We have also sold some prints to real estate dealers and others, which takes care of some of the cost.

We soon learned that we could have saved a great deal of money by starting the map system earlier. The sooner a county begins such a system, the better off it will be.

County Road Records

In DuPage County the road records were in very poor shape and were scattered hither and yon. We found one clerk keeping his records in the attic of his home, and also found one township without any records except of recent date. Rather than lose such records as were available, we hired a man and a stenographer to copy all township and county road records, and made three

The Program

The component parts of a successful county highway program are:

1. A competent man to prepare a program.

2. A term of office long enough to carry out his program, and with a reasonable salary.

3. Cooperation between the state, county and township officials.

4. Proper funds for road work, with provision for a budget.

5. Proper surveys, maps and records.

6. A right-of-way of sufficient width.

7. Some construction work each year in addition to the regular maintenance work.

8. Use of local help and material where possible.

9. Maintenance of the present roads by a patrol system.

10. Building safety into the roads and keeping them safe by study, labor and law.

copies, one going to the town clerk, one to the county recorder, and the other retained by the county superintendent of highways. These typewritten and indexed copies were bound in loose-leaf covers, and we can now look at a map and readily find where a road is recorded and turn to the description of it.

We also make up the new records when a new road is established or an old road vacated, and send them to the clerks for insertion in their books.

Cooperation Essential to Success

The road program is bound to be hindered unless there is complete cooperation between the highway commissioners, town clerks and supervisors in the state of Illinois, or the trustees, boards of commissioners and county surveyors in Indiana, with the county superintendents of highways. A similar situation exists among like officials in other states.

The county superintendent of highways and the county officials should also cooperate with the state officials and also with the officials of neighboring regions which the county's roads serve, or the latter officials, too, may hinder the program. There is also the public with whom the officials must cooperate, and this is sometimes exceedingly difficult. The shortness of the term of office, lack of power to stick to a good program when it is established, and pure laziness or lack of interest, are the greatest troubles that road officials have in establishing a road program. Even if mistakes are made in a program, it is still better to have something to shoot at rather than trying to shoot at everything in general.

Financing

After the maps and records are in good shape, the financial question is next to be attacked. In Illinois the supervisor is the treasurer of the township, and, unfortunately, in some cases he does not know how much his township has in the bank or what its indebtedness is. The county, as well as each township, should have a budget and know exactly where it stands, how much there is to spend for maintenance, new construction and new machinery.

All expenditures in counties in Illinois are supposed to be reported to the county superintendent of highways by the commissioners. In DuPage County there is a special book printed so that the commissioners list their orders in duplicate and send a copy to the superintendent, the commissioner keeping the original in his book. At first, the commissioners did not like this, but now we find they would not be without this record, as they can turn to it without going to the town clerk. The items are numbered and correspond with the clerk's order numbers and also with the supervisor's or treasurer's check numbers.

Bond issues and special taxes have their place, but the greatest good they do is to set out a definite plan and program to follow so that the money is well spent.

Surveys

In improving the highways, a competent engineer should be employed to make the surveys, estimates and plans. The pavement for most county and township work is of a low type, but the grades and lines are about as important as on the higher types, and money can be saved by having competent help to prepare good plans. With only about twelve per cent of the surfaced roads in the country under county control, it is going to take a long time and a lot of money to do this important work.

The most permanent part of any road is the right-of-way. In places where new subdivisions are likely to spring up, road plans assume a very important role, and when the county knows what it wants, nine times out of ten the subdivider and owners will go along with them.

In DuPage County all new roads on section lines and state roads are 100 feet wide, and on quarter-section lines 80 feet wide, and all the other roads are 66 feet wide. We also have three or four roads 200 feet wide.

It seems that in counties where the land is the cheapest you will find the narrowest rights-of-way for roads. Why not prepare for the future and insist upon an adequate right-of-way? Even if the farmers do use part of it, it will be available when it becomes necessary to widen the road. Setback or building lines are also a help and, if possible, should be included in a county program. This is merely another way of protecting a right-of-way.

Drainage Structures

A great many of the old bridges were put in by guess, and there seems to be a tendency to replace them with new bridges of the same size, when in most cases a smaller structure might do the work. It also works the other way, mistakes having been made in not building the structures sufficiently large.

Many mistakes have been made in the sizes of openings for drainage structures and also in the widths of roadways. Narrow roadways with high headwalls or rails are dangerous and for this reason alone, it is better to have plenty of room. The Federal Government has been very helpful in the creation of topographical maps which can be secured at a small cost and used to good advantage in determining drainage areas.

From a paper presented at the Sixteenth Annual Purdue Road School, Purdue University, Lafayette, Ind.

The Municipal Bond Market

By SANDERS SHANKS, JR.
Editor, *The Bond Buyer*

THE month of August, usually the most inactive season of the year in bond circles, has this year been a period of good retail distribution, active interdealer trading and steadily advancing prices. Fundamentally, of course, the bond market's position is more favorable then it has been in years. The general business depression, the lack of confidence of investors in the stock market, cheap money, and an uncertain outlook for business have combined to stimulate the market for high-grade fixed-interest-bearing securities. In the case of municipals, however, we have had the additional factor of a dwindling supply of new issues and this has played an important part in the recovery of prices to a level not far below that reached in the early weeks of 1928.

What is the outlook for the future? Obviously, prices are already back at a point where cities may finance their permanent improvements on quite reasonable terms. The larger cities and counties may now borrow at close to 4 per cent. Is it reasonable to expect that long-term money will become much cheaper than that? It never has in recent times. What we look for is an increasing volume of new borrowing at close to the current price level, with an increasingly broad investment demand for all grades of municipal obligations. The present time appears to present to municipalities an entirely satisfactory opportunity to permanently finance improvement projects for which authorization has been secured.

The following table, giving the details of recent sales of new issues, will indicate the current level of municipal bond-issue rates and maturities in various states, cities and counties:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$57,300	Woburn, Mass.	4	6-yr. (avg.)	3.76
2,443,000	Maryland	4½	9½-yr. (avg.)	3.91
967,000	Suffolk Co., N. Y.	4	10¾-yr. (avg.)	3.96
5,000,000	West Virginia	4	18½-yr. (avg.)	4.046
17,000	Hamilton Co., Ind.	4½	6-yr. (avg.)	4.12
1,329,450	Lucas Co., Ohio	4¼	5½-yr. (avg.)	4.14
60,000	Bradford, Pa. (Sch. Dist.)	4½	30-yr. (ser.)	4.20
102,000	Mount Pleasant, N. Y.	4¼	8 1/6 (avg.)	4.22
3,900,000	Dallas, Texas	4½	20¼-yr. (avg.)	4 28
525,000	Linn Co., Iowa	4½	5 2/3-10 1/6-yr. (opt.-avg.)	4.33

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Resurfacing Asphalt Pavements by the Heater Method

By R. A. MacGREGOR
Engineer in Charge, Division of Maintenance, Borough of Manhattan, New York

IN the past a great deal of patching was done on asphalt pavements by heating the surface with small heaters or fire and applying a skin patch, but this was not very successful. Equally unsuccessful were endeavors to lay a hot top mixture on the old surface, expecting it to adhere. Even the use of small hand burners, as they were called, has been discontinued to a large extent. This has been mainly because of the difficulty in keeping the burners or jets in proper condition, owing to the collection of carbon and consequent stoppage of the flame. Then, too, sufficient care was not taken to obtain a perfectly clean, warm surface before the application of the new hot material. Another trouble was found in the severe shaking which the machine got when it was being towed. These, at least, were the reasons for giving up their use in Manhattan.

New Small Machines Developed

It is expected, however, that very soon new improved heaters for small patching will be secured and used where it is not economical to employ the large machines.

AN ASPHALT STREET PREPARED FOR REPAIR BY SURFACE HEATING AND RAKING

THE MAKING OF A STREET REPAIR IN NEW YORK CITY, SHOWING THE SURFACE HEATER AT THE LEFT AND THE PLACING OF NEW MATERIAL ON THE HEATED SURFACE AT THE RIGHT

The small machines can be used to restore pavement which is sunk one or two inches over cuts, for instance, and on small areas where the resurfacing has worn out, leaving the old sheet asphalt or asphalt block visible. The small portable burners have still a legitimate place in the equipment of a maintenance department, whether in a small town or such a city as New York.

First Resurfacing in Manhattan

The borough of Manhattan did not begin the resurfacing of asphalt pavements on a large scale until 1915, but since then the area covered has been gradually increased each year until now 200,000 to 250,000 square yards is resurfaced each season. Considerably over 1,000,000 square yards of sheet asphalt and asphalt block have been resurfaced in Manhattan to date.

When sheet asphalt or asphalt block pavement has been in use ten to fifteen years, it is likely to have a rough and irregular surface due to openings, settlement and actual wear and tear, yet what is left has life in it still, and the portion remaining will be mostly the binder with some fine material, down to and including 200-mesh material obtained from the top wearing surface, with the aggregate retained in the binder.

The aim is to obtain a new wearing surface, healing to some extent the cracks and cuts in the old pavement and replacing the amount of wearing surface actually worn off. This brings the top up to meet the grade of manhole heads and other metal boxes in the street and gives an actual added life to the pavement almost equal to that of the original.

Steam- and Gasoline-operated Machines

The original Lutz heaters had a steam boiler for the operation of the entire machine and the vaporization or atomizing of the fuel. The heat was generated in a large combustion chamber, and the flame did not reach the pavement. As internal-combustion engines became more common and more reliable, the steam gave way to gasoline-operated engines, and the fuel for heating was merely vaporized or atomized under pressure in a burner directly under the hood. This makes a much simpler machine than the original, though it has departed entirely from the idea that only indirect heat should reach the pavement. At least one indirect-heat machine is now on the market, and both have been used by the writer with satisfactory results.

Surface Must Be Clean

With either machine it is essential for good results that the old surface of dirt

and grease be entirely removed and a fresh, clean asphalt surface obtained for the new top. This is done by the use of heavy-toothed hoes, taking off the old and burnt material, and raking the pavement immediately after the moving of the heater. The material removed has usually very little good bitumen in it, though occasionally some of it can be used for filling small holes. Its suitability is easily determined by its strength after cooling. Examination of samples cut out from resurfaced streets occasionally shows clean sand without any film of bitumen. Here the scraping was not done carefully enough to remove all the dead or burned material. Since the men have been more carefully trained, very little peeling of the new top has occurred and, in fact, in many streets the top course has worn down to the old surface before any peeling was found.

Speed of Resurfacing

Perhaps the greatest advantage in the use of the surface heating method is the rapidity with which the new paving is done. While the saving in cost to the city is considerable, the saving in cost to the community is much greater. The interference to traffic is only partial for eight hours a day for two or three days in a city block, against the entire closing to traffic for a week to ten days at least, and in many places for a month or more. In Manhattan, with an eight-hour day carefully observed and work carefully done, both as to heating and rolling, 800 to 900 yards a day is the average. Reports from other towns give a much larger output usually by contractors, probably with a nine- or ten-hour day and with less careful work.

Costs

The cost in Manhattan in the last five years has varied from $1.10 to $1.25 per square yard, while the cost in the same years for asphalt pavement only, without foundations, has varied from $2.75 to $3.40. The cost of resurfacing includes all street and plant labor, transportation, a percentage for overhead salaries up to and including the engineer of maintenance, and all materials, including fuel oil. It does not include the cost of electricity or water in the asphalt plant, depreciation, interest on investment for land and plant, or insurance for accidents or workmen's compensation. All of these, of course, must be included in the contract prices for new asphalt pavement.

Methods

The new wearing surface averages from 1¼ inches to 1½ inches in thickness. Where the old pavement requires more thickness to obtain a proper crown, close binder is used to give more stability than would be obtained with the same thickness of all top mixture.

Owing to the danger of damage to the curb, a strip about one foot wide is cut out by pneumatic hammers and a similar strip is cut along rails, as the heater cannot be operated up to the rails without interfering with street-car traffic. These strips are replaced with close binder up to 1½ inches from finished grade.

Because of the well-compacted lower course which has become compressed through years of traffic use, the new wearing surface receives a better compression than a new pavement. At least, this is my theory. Tests for density show higher results, and the surface shows fewer waves after rolling. Of course, the latter might be due to the care given to the rolling by the men, who are not pushed and who are picked from eighteen to twenty roller men in the Manhattan force.

In the years 1915 to 1918, 262,000 yards were surfaced. Of this, ten streets with an area of 29,700 yards, or about 11 per cent, were given a second resurfacing in 1927, showing a life of nine to twelve years. The average life of these ten streets prior to the first resurfacing was eleven years, all being very heavily traveled streets. This proved the value of resurfacing. It is to be considered also that the work done in the first few years was not up to the standard now obtained.

From a paper presented at a meeting of the Engineers Club of Philadelphia.

1930 Census Figures—Cities Over 50,000

THE following list, representing census releases by the Department of Commerce since July 21, includes all cities having over 50,000 population in 1920, for which 1930 figures have not previously been published in THE AMERICAN CITY. It includes, also, cities which have grown into the 50,000 class since the 1920 census, for which figures have been announced since July 21. Similar lists have appeared in the three preceding issues of THE AMERICAN CITY, covering periods since the earliest releases:

CITIES OVER 50,000 IN 1930 CENSUS

City	1920 Census	1930 Census
Albany, N. Y.	113,344	127,358
*August, Ga.	52,548	60,204
*Austin, Texas	34,876	53,118
Baltimore, Md.	733,826	801,741
Bethlehem, Pa.	50,358	57,773
*Boston, Mass.	748,060	787,271
*Cedar Rapids, Iowa	45,566	56,078
Chicago, Ill.	2,701,705	3,375,329
Cleveland, Ohio	796,841	900,376
Decatur, Ill.	43,818	57,378
Detroit, Mich.	993,678	1,573,985
Fall River, Mass.	120,485	115,301
Flint, Mich.	91,599	156,422
*Galveston, Texas	44,255	53,427
Gary, Ind.	55,378	100,749
*Grand Rapids, Mich.	137,634	168,650
*Hartford, Conn.	138,036	163,818
Highland Park, Mich.	46,499	52,883
*Houston, Texas	138,276	289,579
*Indianapolis, Ind.	314,194	364,073
Jersey City, N. J.	298,103	315,642
Kansas City, Mo.	324,410	392,761
*Little Rock, Ark.	65,142	81,657
*Long Beach, Calif.	55,593	141,528
Los Angeles, Calif.	576,673	1,233,561
*Malden, Mass.	49,103	58,143
Miami, Fla.	29,571	110,514
Milwaukee, Wis.	457,147	572,324
*Mobile, Ala.	60,777	68,277
*Montgomery, Ala.	43,464	66,075
Nashville, Tenn.	118,342	153,153
Newark, N. J.	414,524	442,842
*New Bedford, Mass.	121,217	112,836
New York, N. Y.	5,620,048	6,981,927
Philadelphia, Pa.	1,823,779	1,964,430
Pontiac, Mich.	34,273	64,897
Port Arthur, Texas	22,251	50,067
Portland, Ore.	258,288	301,890
*Providence, R. I.	237,595	252,243
*Rockford, Ill.	65,651	85,831
Saginaw, Mich.	61,903	80,350
St. Louis, Mo.	772,897	822,032
Salt Lake City, Utah	118,110	140,184
*San Francisco, Calif.	506,676	637,212
*Savannah, Ga.	83,252	87,714
*Sioux City, Iowa	71,227	79,212
South Bend, Ind.	70,983	104,066
Springfield, Ill.	59,183	71,857
Waterbury, Conn.	91,715	101,02[illegible]
*Wichita, Kans.	72,217	111,0[illegible]9
*Worcester, Mass.	179,754	196,837
Yonkers, N. Y.	100,176	135,123

* Revised.

Among these cities, many of which submitted chamber of commerce estimates as to the 1930 populations (published in the April number of THE AMERICAN CITY), are two with remarkably accurate estimates: Milwaukee, Wis., with an estimate of 572,000, and an actual enumeration of 572,324; and Flint, Mich., with 158,000 estimated, as compared to 156,422 actual. Four of the remaining cities submitting estimates varied less than 3 per cent from the actual figures: Fall River, Mass., estimated 117,500, actual 115,301; Nashville, Tenn., estimated 150,000, actual 153,153; Saginaw, Mich., estimated 78,500, actual 80,350; Springfield, Ill., estimated 73,467, actual 71,857. Baltimore, Md., and Detroit, Mich., were within 5 per cent in their estimates.

As promised when requesting the population estimates last February, THE AMERICAN CITY will publish in an early issue a page group of portraits of the twelve civic-commercial organization executives who have most accurately estimated the populations of their respective cities. Announcement of the successful contestants will be postponed another month or two, pending further revised figures from the Bureau of the Census.

1930 CENSUS EMPHASIZES THE SUBURBAN TREND

FOR some time it has been appreciated that urban communities grow fastest at their perimeters, while at their centers population is displaced by commercial uses. Residential use at the hub cannot compete with commercial demand. This has been very obvious south of Chambers Street in New York City, in the Loop district of Chicago and on Beacon Hill in Boston, and in the city proper of London.

The 1930 census is apparently going to reveal this movement advancing at an accelerated pace. The Cleveland Health Council has been one of the first agencies to analyze the new census data. The great majority of the census "tracts" in central Cleveland have lost in population. In more than a score of them this loss has exceeded 30 per cent and has reached 70 or even 90 per cent. In outlying sections, in and without the city's legal limits, the gains have been quite as striking. Parma village, for example, has grown in the last decade from 2,400 to almost 14,000, Garfield Heights from 2,500 to 15,500. Cuyahoga County as a whole has grown 118 per cent.

Why Bother with Bug and Chemical Tests at Small Water-Works Plants?

By J. M. JESTER
Assistant Engineer,
Washington Suburban Sanitary District,
Hyattsville, Md.

OPERATORS of small filtration plants frequently fai lto recognize the importance of making certain daily tests as well as recording their results. Some may consider these tests too difficult, while others may not run them for lack of interest. As a rule, the necessary tests may be run at the small filtration plant without a great deal of effort. A copy of "Water Purification Plants and their Operation," by Stein, and of "Standard Methods of Water Analysis," by the American Public Health Association, will be found helpful to the operator.

The water supplied a community should be safe from a bacteriological standpoint and of acceptable physical quality. These requirements can be effected only through the frequent running of routine tests. The results of the tests, if recorded, will be valuable in establishing the purity of a water for weeks previously, in the event of a typhoid epidemic, as well as an aid in eliminating many operating difficulties. A comparison of records from time to time will help in obtaining better plant efficiency, and if the records are placed in the proper authorities' hands they may aid operators of other plants, should they have difficulty with unusual operating conditions.

Sampling

In order to obtain accurate results from tests, care should be taken in the collection of samples for testing. Carelessness in gathering specimens is not only a waste of time, but misleading in the results obtained. When taking samples for chemical analysis, glass-stoppered bottles free from alkalies and acids should be used. The bottles should be rinsed several times in the water to be tested before actually collecting the specimens. When taking a sample from a stream, the bottle should be filled by a slow motion away from the body, in order to prevent the water from coming in contact with the hand before entering the bottle.

Turbidity

Next to the proper sterilization of a water-supply, the elimination of turbidity is of prime importance. The efficiency of the whole filtration process depends largely upon the continuous removal of turbidity from the raw water. The operator of a filtration plant should know at all times both the degree and character of the turbidity in the raw water entering the plant, and the completeness of turbidity removal in the filtered water. Turbidity, as to character, is gaged by its coarseness or fineness. This condition will depend to a large extent upon the geological nature of the watershed. A knowledge of the raw turbidity is necessary at all times in order to determine the proper amounts of coagulants to be applied.

When difficulty is experienced in obtaining a satisfactory floc with a fine turbidity or after a sudden thaw, jar tests will be found to be of much practical value in determining the amount and combination of coagulants to obtain the best floc. I recall several years ago when difficulty was experienced in treating a raw water with a turbidity of several hundred p.p.m., following a sudden thaw, a sample of the water was taken and a jar test run. Very little floc was obtained with a straight alum treatment, regardless of the dosage. A better floc was obtained by the addition of soda ash, and a satisfactory floc by the combination of alum, lime and soda ash. The proper dosage known, this combination was applied on a plant scale with satisfactory effluents resulting. Jar tests require but little time, and the results obtained, both in satisfactory effluents and a probable saving in chemicals, are well worth the effort.

While a high raw-water turbidity does not always indicate a high state of pollution, and filter effluents having a turbidity of 5 p.p.m., or thereabouts may not cause complaint from the consumer, the lower the effluent turbidity is kept, the lower the residual chlorine may be dropped to insure sterile water.

For the reading of turbidities ranging from 5 to 100 p.p.m., the bottle type turbidity standard is generally used, while with turbidities above 100 p.p.m., the candle type turbidimeter is more satisfactory. With the bottle type standards, the bottle used for collecting the samples should be of the same make as those which contain the standard solutions. If the operator permits this bottle to become coated on the inside, incorrect readings will result, especially with turbidities ranging between 50 and 100 p.p.m. With the candle type turbidimeter, care should be taken to keep the flat bottom of the graduated glass tube free from sediment.

In determining the turbidity of effluents, the Baylis type turbidimeter is recommended. This turbidimeter has a range of 0.1 to 2 p.p.m. and will aid materially in keeping the turbidity of the effluents at a minimum. Prior to the use of this type of turbidimeter at the Burnt Mills Station of the Washington Suburban Sanitary District, a residual chlorine figure of 0.28 to 0.35 p.p.m. was necessary for satisfactory bacterial results, but since its use better effluents have been maintained and satisfactory results obtained with residual chlorine ranging from 0.14 to 0.25 p.p.m.

Hydrogen-ion Concentration

Hydrogen-ion concentration, more frequently termed pH, is based upon the magnetic attraction of positively and negatively charged ions of which the water is composed, and is used to determine to what degree a water is acid or alkaline.

There are several methods which may be employed to determine the various pH values of water, but for general purposes the colorimetric method seems the most satisfactory. This method employs the use of a standard color indicator and a set of color standards. The color of the indicator to be used, as well as the range of the color standards, depends upon the acidity or alkalinity of the water to be tested. Color standards should be kept in a dark place when not in use, and away from sunlight as much as possible, to prevent fading. The standards should be checked for accuracy at least once a year.

In making pH determinations the hands should be clean and free from acids or alkalies, as a very small amount of either coming in contact with the water to be tested will result in incorrect readings.

Hydrogen-ion determinations, both in the raw and in the filtered water, are highly important in the daily operation of the filtration plant. Waters have varying degrees of acidity or alkalinity, and a maximum precipitation of impurities will take

Results Cost Money

There are several reasons why many small plants unfortunately do not have the necessary tests made to insure the satisfactory operation of the water-works from the chemical, physical and bacteriological standpoints. The first reason is that the city fathers do not see fit to spend any money even for the bare necessities of laboratory equipment. They have the idea that once the plant is built, it should run practically automatically and produce a satisfactory water. This is impossible. The raw material, that is, the water coming to the plant, varies widely from year to year, from month to month, from day to day, and even from hour to hour, and its characteristics must be watched carefully to insure the proper operation of the plant. The city fathers sometimes do not think it necessary to employ a trained man to operate the plant, but let the son of the police marshal or some political henchman smoke his pipe at the plant. If you can't afford a trained operator, at least employ the services of some testing laboratory or consulting engineer whose representative can regularly visit your plant and check up on its operation.

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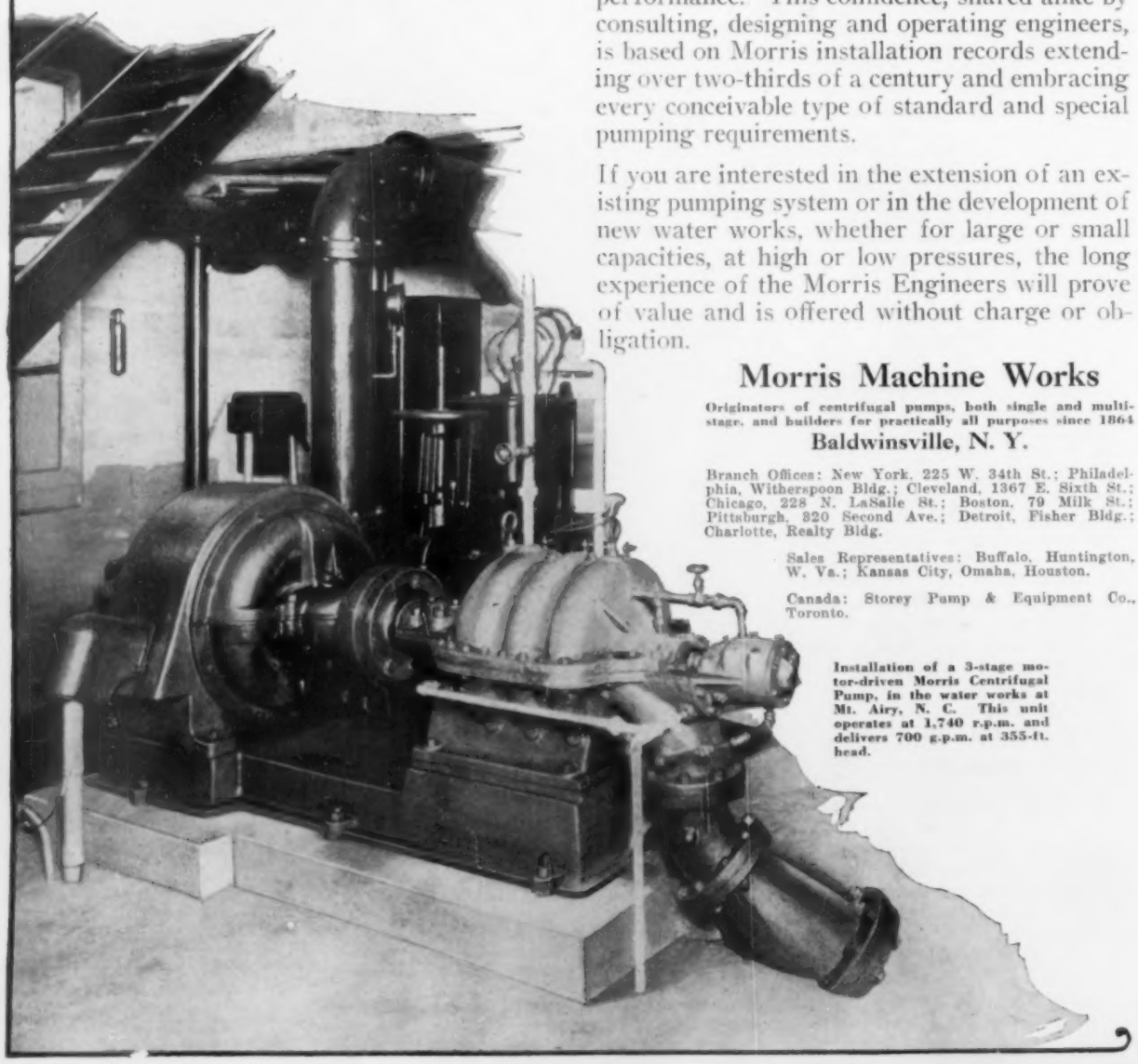

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Installation of a 3-stage motor-driven Morris Centrifugal Pump, in the water works at Mt. Airy, N. C. This unit operates at 1,740 r.p.m. and delivers 700 g.p.m. at 355-ft. head.

place at a certain pH, which is termed the optimum point. The optimum point for a given water may be obtained by running a series of jar tests with various turbidities and under differing operating conditions. A curve plotted from the results of these tests will aid materially in obtaining satisfactory coagulation during unusual operating conditions. Should the pH value of the raw water be below the optimum point, alkalies are added in obtaining a good floc, or should the reading be higher than the optimum point, more alum is required where alum is used for a coagulant. The pH control on raw water will prove exceedingly helpful in controlling chemical dosages and obtaining satisfactory coagulation.

Alkaline water is highly desirable in the distribution system, as acid waters are likely to cause complaint and criticism. The most frequent complaint heard is that of red water. This is due to an acid water attacking the plumbing and the reaction which takes place when the acid water is heated in the hot water tank. There is no doubt in the writer's mind but that red water troubles could be practically eliminated if the proper pH in the filtered water were maintained at the filtration plant. Aside from red water troubles, an acid water will cause galvanized piping in house connections and plumbing to corrode to such an extent that it may have to be completely renewed in a comparatively short time. Also, the carrying capacity of the watermains will decrease.

As previously stated, an alkaline water is desirable, but it should be borne in mind that if the pH value be kept too high, the water will be hard and not palatable, which may also result in complaints. Hourly determination of filtered water pH will result in water of uniform alkalinity being delivered the consumer.

Hardness

Hardness, usually caused by calcium and magnesia, is expressed in terms of calcium carbonate. The calcium carbonate equivalent of calcium and magnesium content, sometimes with iron and aluminum, is a measure of total hardness in a water. The soap method of determining total hardness, though giving only approximate results, is usually satisfactory for the small plant. With this method a standard soap solution is used to titrate 50 c.c. of the sample in a 250-c.c. glass-stoppered bottle until a permanent lather is obtained. The amount of soap solution required being known, the total hardness in p.p.m. may be found by referring to Table No. 5 in "Standard Methods of Water Analysis."

The amount of total hardness a water may have, without causing complaint regarding taste and suitability for washing purposes, depends upon the locality being served. Some communities are supplied a water having a total hardness of 100 or 200 p.p.m. There is no complaint, because the populace is accustomed to a hard water. However, a water having a total hardness of not more than from 25 to 35 p.p.m. is desirable.

Hard water is objectionable to large consumers using tubular boilers, because of the incrustation which forms on the boiler tubes, causing a higher fuel consumption and the necessity of more frequent cleaning of the tubes.

Tests for total hardness should be made on the raw water and filtered water at least once each day.

Residual Chlorine

Tests for residual chlorine should be frequent enough for the operator to know at all times the amount present in the filtered water. The most usual method for determining residual chlorine is with ortho-tolidine. This method consists of a standard ortho-tolidine solution with permanent color standards. For the small plant it is most convenient and accurate to buy this type of outfit from a reliable firm selling such supplies.

The amount of available chlorine required to sterilize a water depends upon the amount of organic matter present in the water. The lower the effluent turbidity and the lower the amount of organic matter present, the smaller the quantity of chlorine needed for sterilization. As fluctuations in water temperature, organic matter and water delivery affect the amount of chlorine required, it is advisable to make a residual test once each hour or so. In this way accurate control may be maintained. Should the effluent become turbid, bacteriological results show positive, or any other unusual conditions occur, the chlorine dose should be immediately increased sufficiently to take care of the existing condition.

It is desirable to run the residual chlorine as low as possible, consistent with safety, because of its tendency to aggravate and produce objectionable tastes and odors. Popular complaint on this score, though annoying, is of secondary importance to sterility.

Tastes and Odors

The waters from most streams, suitable for use as sources of public water-supply, do not possess, under ordinary conditions, seriously objectionable tastes or odors, except where there are industrial plants emptying wastes above the supply intake. There are periods, however, when tastes and odors in the waters of streams, generally speaking, are objectionable. These are usually after a heavy rain or thaw. The frequent testing for tastes and odors will result in a quicker detection of objectionable conditions, and if their removal is possible and prompt, this action may save considerable criticism from consumers.

For testing odors in cold water, approximately 250 c.c. of the sample are placed in a 500-c.c. bottle and shaken well. The bottle is then allowed to stand until the water has reached approximately the temperature of the room, whereupon the stopper is removed and the odor noted. For testing odors in hot water, approximately 150 c.c. of the sample are placed in a 500-c.c. Erlemyer flask, covered with a tight-fitting watch glass, and heated. Just before the boiling point is reached, the water is agitated by a revolving motion of the flask, the watch glass removed, and the odor noted.

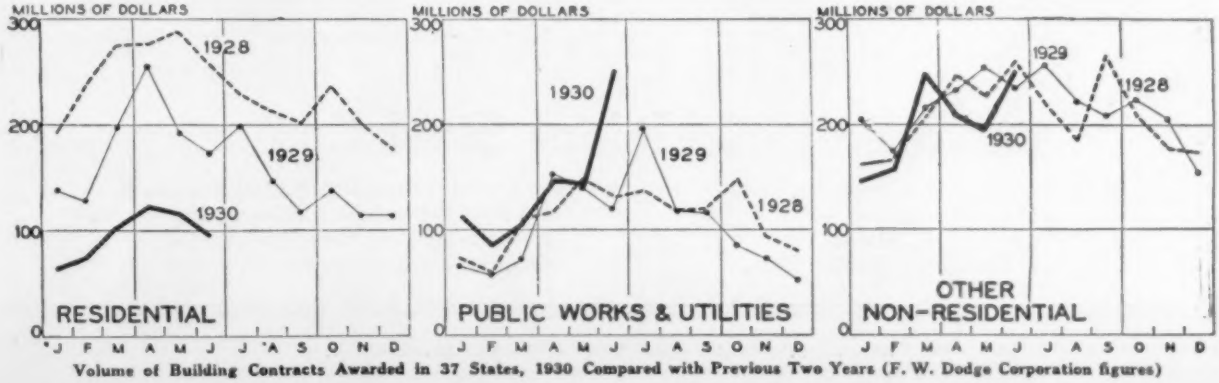
A comparison of the results obtained from these tests following turbidity changes, thaws, etc., may be of much value in determining the cause of certain objectionable tastes and odors. The results of taste and odor tests should be recorded to agree with the designations for quality and strength given by the "Standard Methods of Water Analysis."

Conclusion

The above determinations can be made by any operator if he is interested in the proper control of his plant. Frequent observations are necessary if the results are to be of real value. Such procedure will give the operator a better understanding of the principles involved in water purification, the causes of operating troubles, and the methods to be employed in eliminating such difficulties..

From a paper presented before the Maryland-Delaware Water and Sewerage Association.

Public Works Contracts Increase While Private Construction Lags



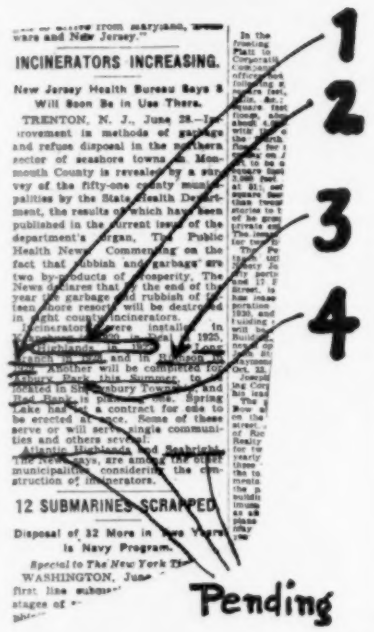
Volume of Building Contracts Awarded in 37 States, 1930 Compared with Previous Two Years (F. W. Dodge Corporation figures)

4 of these 7 Cities Chose the "Pittsburgh-Des Moines" Incinerator

The New York *Times* of June 29th says that modern incinerators are rapidly increasing—and are also improving municipal disposal methods for garbage and rubbish, those two by-products of prosperity. The Public Health News, official organ of the New Jersey State Health Department, finds that 15 seashore resorts in Monmouth County will be kept clean and healthy by 8 incinerator plants at the end of 1930.

Of the 7 incinerators now in operation, it is significant that 4 were designed and erected by Pittsburgh-Des Moines Steel Company—namely, the Ashbury Park, Highlands, Long Branch and Rumson plants.

The Pittsburgh-Des Moines Incinerator is today rendering a reliable economic performance for progressive American communities in every section of the country. It operates efficiently at 1500° Fahrenheit, or above, to give complete combustion of all refuse without smoke or odors. The unit system of furnaces permits the addition of more units to keep capacity in line with the growth of population.



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When you write for that catalog, kindly mention THE AMERICAN CITY.

The Policeman and the Traffic Offender

Treating Every One Alike Does Not Necessarily Mean Justice

By CLARENCE P. TAYLOR
Sometime Albert Russel Erskine Fellow, Harvard University

Handling of Violators

BEFORE the advent of the automobile only a small percentage of the people ever came in contact with the enforcement branch of our government. Now it is unusual to find any one who has not had some experience, probably unpleasant, with the officers of the law. A prejudiced public is unsympathetic about improving working conditions for the force. They tend to be uncommunicative when questioned, poor as witnesses and worse as jurors. An officer must have salesmanship. He must be a salesman, for in truth he must sell something which the other party does not want and must make him like it. In no other way will traffic officers be able to induce a favorable public attitude toward their work.

There are two general methods of handling violators: one is to treat alike every one who commits the same crime in the same degree; the other is to accord to each violator that type of treatment which will be most likely to draw all to the same level of good conduct. Each has its limitations and neither can be wholly adopted to the exclusion of the other.

It is almost a cardinal principle in American penal ethics that all persons should be treated alike. While it is true that such procedure "whitewashes" the prosecution of favoritism, it is not true that justice is always done, and, what is more to the point, it neglects the opportunity to promote safe and expeditious movement of traffic.

Assume that two people were stopped for going forty-five miles per hour at the same time and on the same road, and the officer, believing it his duty, used no discretion and tagged them both. If one had been warned many times before by the officer but the other was rushing a badly injured man to the hospital, would it be justice to treat them both alike? Obviously not, yet an officer's task is fraught with many problems even more delicate than this, which depend almost entirely upon his judgment as to how justice will be done. Therefore, it is important to point out here that treating every one alike does not necessarily mean justice.

Every human being is different, and the sort of treatment which will cause one to reform or improve may cause quite the opposite reaction in another. To treat every one alike would be like hunting every kind of game with the same gun and ammunition. An officer ought to take stock of the "guns and ammunition" at his disposal and decide how each may be used to most advantage, varying his tactics to meet the exigencies of a situation or the personality of a violator.

No matter how serious a violation or how exasperatingly flagrant or unnecessary it appears, it is almost never a violation of the personal rights or privileges of the officer but an offense against the public; therefore, he should never make a personal issue of the matter. There really are no grounds whatever for an officer to so act as to leave the impression that a traffic violation is a personal grievance for which he is seeking vengeance.

Such an officer makes not only his own task harder but that of other officers as well. It is generally conceded that the sympathetic attitude of the English, Canadian, and Cuban police is responsible for their great successes. "Indeed," says Raymond B. Fosdick in his book "European Police Systems," "a London 'Bobby' is more or less a favorite with the people. He is liked, respected and generally admired."[1] Quite in contrast, he states that "traffic is handled in Berlin by dint of much shouting and abuse. A citizen who inadvertently, perhaps, disobeys a rule of the road is apt to be made the object of an impassioned denunciation audible for half a block."[2]

A traffic officer's stock in trade is the great variety of means at his disposal to accomplish the ends for which he is employed. He may obtain splendid results by a friendly smile; he may find occasions where a little talk followed by a gentleman's agreement will be efficacious; with some people he may need to exercise his authority of arrest; with others, inclined to defy and resist authority, he may have to resort to the use of force. The following paragraphs attempt an inventory and appraisal of this stock.

The Traffic Officer's Stock in Trade

Politeness.—A large majority of people respond to politeness, and the officer who is sincere in his politeness usually can win a violator to his point of view without much difficulty. It will never pay an officer to become any the less a gentleman even when he encounters one who fails to appreciate politeness. Such people had better be handled by the courts. As soon as a person proves himself ill-mannered, quarrelsome, or entirely incorrigible, the officer's duty is to say little and send the party to court.

Kindness.—Almost no one will fail to appreciate an act of genuine kindness, and certainly there is nothing which adds more pleasure to traffic work than rendering such service. The recipients, and often their friends too, hold great respect for the helpful officer and strive diligently to observe his directions. "Kill them with kindness" is the slogan in one police department, a policy which could well be adopted in all.

Appearances.—A frown, a smile, or a look of disgust at a foolish error of no particular consequence may be more effective than officiousness or abuse. An officer who can smile away the little troubles will find his day's work less fatiguing and more pleasant. All conversations should be conducted in as quiet and unobtrusive a manner as is possible.

An officer on foot, if he wishes to stop certain automobiles, can do it just as well by standing at one side of the approaching cars, as he would by standing with arms outstretched directly in front of them. In the former method he has a better chance to escape being run down either accidentally or deliberately.

The officer should at once politely inform the motorist why he has been stopped, and, if possible, should state what he intends to do. The violator informed at the outset of the proposed action is less likely to become quarrelsome or argumentative than if he were kept in doubt. Furthermore, if the officer has no intention of tagging him and promptly says so, it is not possible for the violator to carry away any false impression as to having "talked himself out of a tag," or having gained special consideration because he mentioned the name of an influential friend. The officer should finish his business quickly and leave. He should have made it perfectly clear what the violator is expected to do and when he is expected to do it. If he is to appear in court, he should be given specific directions; or if he must have his brakes adjusted and return later to headquarters for an inspection, such requirements should always be furnished in writing.

In some instances, "lectures" or little talks may have a beneficial effect in bringing violators to a better understanding of their relations to the safe and expeditious movements of traffic. If a violator is informed that an arrest is not contemplated, very often he will listen with an open mind.

Warnings.—Warnings are a useful adjunct to enforcement, if the violator can be made to feel that they are significant. They are appropriate in border-line cases, where the violator needs to be treated with more severity than by simply talking to him and eliciting a promise of good behavior, although tagging or arresting would be too severe.

Violations reported by citizens' reporting committees are usually handled by

[1] P. 234.
[2] P. 231.

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a letter courteously advising the violator of the report and requesting him to exercise more care in the future or requesting his appearance at headquarters to talk over the matter with one of the officers. Prosecutions are seldom made, but warnings are sometimes sent to the effect that if any more reports are received, a prosecution will be requested.

Leniency for Strangers.—An admirable policy of many cities and towns has been to be extra-lenient and courteous with strangers who are staying in the community. They seldom arrest such outsiders for minor infringements, and a few places have developed special warning tags on which a person is politely requested to conform with the law.

Extra-Legal Measures.—The power of arrest and summonsing are valuable tools which may be used well or badly. The suspension of arrest or summons may be used to exact certain appropriate stipulations. While promises of future good behavior may be considered mild conditions for suspension of prosecution, there are others of more serious character, such as the voluntary surrender of the license for a period, attendance at a school for drivers, probation with reporting to headquarters at stated intervals, etc. Suspension of prosecution fits in best when the character of the offense or the attitude of the individual seems to require moderately severe treatment and when it would not be entirely wise nor perhaps most effective to take the case to court. Minors and women are especially responsive to this kind of treatment. In exercising measures of this sort, the officer must be fair and just, always being careful to make the violator understand that the agreement is entirely a voluntary one and that he may choose to go to court if he wishes.

Enforcement Drives.—As a means for introducing a new traffic law or idea to the people, the drive or campaign has a legitimate place, but as a method for enforcing old traffic laws it is very unsatisfactory. If a law is worth enforcing, it is worth enforcing continually, and so it is grossly unfair for an officer to arrest a person for a certain violation one day because a drive is on and then to disregard the same violation when there is no drive.

Arrests.—Despite the fact that several states have deprived their officers of authority to make arrests on most or all of the traffic charges without first applying for warrants, occasions do arise when an immediate arrest is a necessary and most logical procedure. People who can not satisfactorily identify themselves, known criminals, transients, non-residents, liars, especially provoking and flagrant violators, and violators whose improper conduct merits their being brought to headquarters, are some of the classes of offenders who ought to be subject to arrest at the discretion of the officer. Sometimes the power to arrest exists for violation of city traffic ordinances, but not for violations of the state law.

Arresting the Car.—Detroit has had such remarkable success with its system of towing to a central garage all cars found violating the parking laws, and charging a fee for recovery, that the method bids fair to become widely adopted elsewhere. Its applicability to parking violations is most appropriate, since an illegally parked vehicle is usually a public nuisance and its removal is therefore a distinct benefit. This procedure also eliminates the necessity for an officer to wait for the return of the driver. As long as the department has the car, there is no difficulty over the identity of the violator either. This system does, however, require the employment of a towing crew, and a central storage garage with attendants.

The traffic violations bureau is the modern solution for the problem of properly and expeditiously handling prosecutions in the next stage. A schedule of fines is published for the different offenses, and a corps of workers in the bureau check back over each violator's record for former offenses, and at the same time take care of all the rest of the clerical work connected with the case. A properly organized and operated traffic violations bureau makes case fixing almost impossible.

EDITOR'S NOTE.—The foregoing article is a portion of the "Traffic Officer's Training Manual," by Clarence P. Taylor, edited by Miller McClintock, Director, The Albert Russel Erskine Bureau for Street Traffic Research, Harvard University. The book is published by the National Safety Council, 20 North Wacker Drive, Chicago, Ill. A review of the book appears on page 181 of this issue.

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Street Parking Increases Costs

LEGAL as well as illegal parking on downtown streets is driving good Father Pitt nearly distracted. While trying to silence the outcries of the weighty civic problems he is carrying, he cannot "get anywhere" with them because valuable street space is filled with parked cars that clog his forward steps. The accompanying cartoon in the July issue of *Better Traffic* shows the difficult situation.

In an article in this periodical published by the Better Traffic Committee, which is appointed by the Mayor of Pittsburgh as an auxiliary and advisory body to the various city departments working on traffic problems, W. J. Moore, Chairman of the Trucking and Deliveries Sub-Committee, calls attention to the fact that "Trucking Must Be Done," and shows that, while the elimination of work horses from the Triangle District is an aid in clearing the situation, the most important cause of truck fleet operators' problems in that section is parking on narrow streets. In 1929 the total number of illegal car-parking hours was more than twice that in 1927. Mr. Moore says:

"If no-parking on the streets is made an actuality, where will the cars go? The wharves may be developed to handle far more cars than they now do. There is already far more off-street parking space in the Triangle than could be used by all the cars which now might be using it. *Another important point:* A no-parking provision on a street is *not* any different than a loading zone provision on a part of a street. The two are identical in meaning and legal background. One merely applies to a part of a city block and the other to one or many city blocks.' '

A COSTLY PRIVILEGE

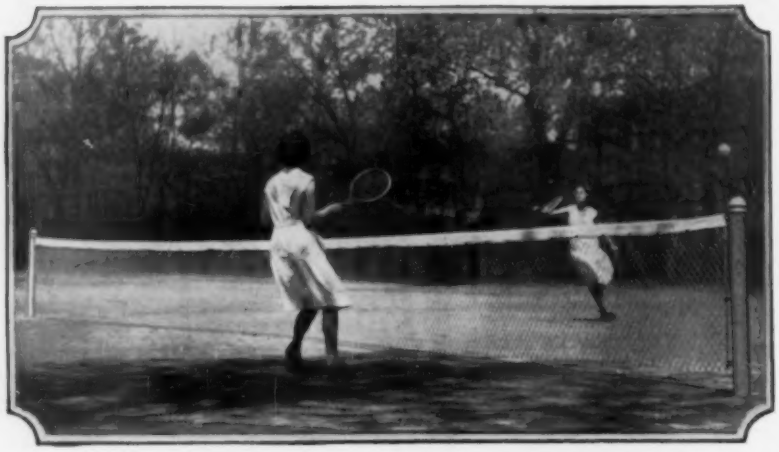
"Closed for Play Streets Are Dangerous

THE wisdom of street playgrounds is being questioned by teachers engaged in carrying on safety education campaigns in schools, according to a statement made by Margaretta Wills Reeve, Chairman of the White House Conference on Child Health and Protection, in the process of outlining some of the more urgent problems now being considered by her committee with a view to their presentation at the November Conference in Washingon.

"Many cities," she says, "have taken advantage of roped-off side streets as a cheap way of providing play space in the heart of thickly populated regions." It has, however, begun to be observed by those who come closely in contact with the problem, that children have not the judgment to distinguish between the times when a street is officially closed for play by being roped off or having wooden barriers placed, and when it has assumed its official status and thereby becomes a danger spot. Last year more than 100,000 children were hurt while playing in streets.

"If we are to keep children from playing in the street, we must plan other outdoor play space. Where shall we find it? How shall we equip it? What leadership shall we provide? How much can we afford to spend on upkeep? And whose duty shall it be to provide these things for our children? These are some of the questions upon which the committee is preparing conclusions."

STEEL WIRE TENNIS NET



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No reel to bother with
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Cannot injure or cut the ball
Stays in perfect position permanently
Beautifies the tennis court
Pays for itself the first year

A Revolutionary Money-Saver for Parks, Playgrounds and Schools

Here is a tried and tested practical invention that pays for itself the first year. Durability of construction guarantees years of service. Easily, quickly and permanently erected by ordinary labor. Installation ends forever the high cost of labor and trucks used to erect and remove cord nets. This great saving more than pays for the American Chain Link Tennis Net the first year.

Where nets can be stolen, and are stolen, the advantages of this net are obvious. It can be erected easily and quickly by any type of labor. Its installation is final . . . You can leave it on the court summer and winter. It need never be taken down. It is rust-proof and wear-proof. This net is an ideal solution to tennis court problems, and maintenance costs.

Pays for Itself Many Times Over the Very First Year—In Cost —In Convenience

Officials tell us that the cloth nets used on courts maintained by public parks and playgrounds must be replaced twice annually. This cost is eliminated by the American Chain Link Tennis Net. Also,

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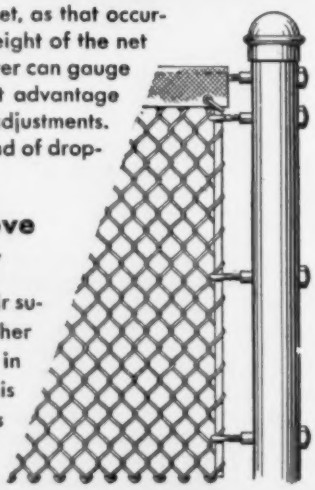
records prove that labor costs . . . erecting and removing nets each day on public courts . . . average five times the cost of the net itself. This terrific expense is also eliminated by the use of the American Chain Link Tennis Net.

Preferred by Amateurs and Champions

The canvas strip gives the player the same action when a ball hits the top of the net, as that occurring when a good cord net is used. Also the height of the net is always the same. It never varies. Thus a player can gauge his shots with absolute accuracy . . . a great advantage over the cloth net which requires frequent adjustments. When ball hits net, it rolls straight back instead of dropping dead to the ground as with a cloth net.



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American Chain Link Tennis Nets have proved their superiority in Chicago's public parks, and many other cities. Birmingham made a trial installation and in two weeks' time equipped all public park tennis courts with them. Experience has proved that it is the best and most economical tennis net obtainable. Investigate! Write for descriptive literature, prices, and other facts.

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Items on Planning and Traffic

Their Works Live After Them

IN the death of George B. Ford, following an operation, on August 13, another name has been added to the illustrious list of pioneers and leaders among city planning and zoning consultants whose passing has occurred during the twenty-one years since THE AMERICAN CITY was established.

Daniel H. Burnham, Nelson P. Lewis, Charles Mulford Robinson, Arnold W. Brunner, George E. Kessler, James Sturgis Pray, Charles W. Leavitt, Charles B. Ball, Andrew Wright Crawford, George B. Ford—these men and others have left behind them vital monuments in the orderliness and enrichment of community life which will not only live, but continue to grow, as long as American cities shall exist.

City Planning Course at the College of the City of New York

A NEW course in city planning will be instituted this fall in the evening session of the School of Business of the College of the City of New York, by Wayne D. Heydecker, Associate Director of the Regional Plan Association.

The course will be in the nature of a study of the elements of the city plan and the technique of city-planning practice. It will consider city-planning powers, preparation of plans for street layout, rapid-transit lines, location of buildings, zoning regulations, and systems of financing.

Registration for the course, which will be given on Thursday evenings, will take place at the Business Building of the College at 23rd Street and Lexington Avenue, beginning September 11 and continuing until September 24.

Real Estate Subdivision Should Meet Modern Needs

MUNICIPAL control over all land platting, under the guidance of carefully prepared, comprehensive city plans to protect the interests both of the subdivider and of the public, was urged by Jacob L. Crane, Jr., city planner, of Chicago, in an address before the Home Builders and Subdividers Division of the National Association of Real Estate Boards at the Association's recent twenty-third annual convention in Toronto. Mr. Crane said he found that a subdivision plan under revision, "going back and forth from subdivider to surveyor, to plan commission, to engineer, to city council, and so on, usually results in a virtual design by the public agency anyway."

The new principles of subdivision, quite different from the old-time rectangular platting of land, are better adapted to modern conditions. Among these Mr. Crane listed recognition of direct routes for major highways, with widely spaced cross-streets. Long blocks are recommended, with few, if any, houses facing on the major streets, those few to be provided with deep enough lots so that the houses may be set well back from the traffic. Business districts should be limited in area according to the population served, and should be designed to provide their own parking space. Large playgrounds or interior parks should be accessible to all the lots without the necessity for crossing traffic arteries, and school sites should be located in such a way as to be safely accessible to a large enough area to support a full school unit.

Massachusetts Federation of Planning Boards Expands Its Activities

EVERY member of a planning board in the state of Massachusetts is automatically a member of the Massachusetts Federation of Planning Boards. Many of the individual members, however, are not familiar with the Federation or its work, which is the promotion of city and town planning in the state, because the personnel of the boards in some communities changes yearly with changes in administration. To acquaint these members with its work, and to interest members of boards of appeal, city engineers, boards of survey, chambers of commerce, improvement associations, and civic organizations generally, the Federation has expanded its activities this summer by employing a field worker and by publishing a monthly pamphlet of planning news and notes, in addition to the regular bulletin service. As part of its annual meeting, to be held in Boston September 30 and October 1, at which John Nolen, Edward M. Bassett, and Lawson Purdy will speak, the Federation is planning a peripatetic session, inspecting city-planning activities in Boston and nearby communities.

Highway Design and Garage Buildings to Be Featured at International Exhibition

IN the great German Housing and Town Planning Exhibition, to be held from May 9 to August 9, 1931, mention of which was made in THE AMERICAN CITY last month, there will be special sections devoted to highway design and to the architecture of garage buildings.

Three important congresses will be held during the period of the Exhibition. These will be the International Federation for Housing and Town Planning, June 8 to 13; The International Housing Association; and the Studiengesellschaft für Automobile-Strassenbau (a German organization devoted to the design and construction of automobile highways).

A Prophetic Warning of 1909

NOT the least interesting of the historical documents consulted by THE AMERICAN CITY in preparation for this twenty-first anniversary number is the 1909 edition of Street Traffic Regulation, by William Phelps Eno—whose continued interest in the solution of traffic problems is evidenced by his establishment on a substantial basis of the Eno Foundation for Highway Traffic Regulation. In the concluding paragraphs of the introduction in his 1909 book, Mr. Eno said:

"Unless the height of buildings is regulated by law, or by taxation in proportion to their height, or by a combination of the two methods; unless a complete plan for underground rapid transit, sewers and pipe galleries be adopted, before more obstructive subway work is undertaken, no street traffic rules or regulations or enforcement of them can possibly provide for the natural increase of surface traffic, either on the sidewalks or on the roadways of New York City.

"What would have cost practically nothing but a little forethought a few years ago, will now require tens, and, if continued, hundreds, and perhaps thousands of millions eventually."

What Caused the Accident?

IN this striking drawing of complete automobile wreckage, Death itself is shown recognizing the probable guilty one—Alcohol. *Verkehrswarte* (*The Traffic Tower*), published in Berlin, has used in its June number this illustration from the brochure, "Augen Auf!" ("Look Out!"), "the booklet of accident prevention for young and old." An accompanying article by Dr. Max Grünewald, of Dortmund, deals with the effect of alcohol on different personalities, and the mutual menace of driver and pedestrian when either, in consequence of the use of alcohol, is not in full control of the powers of attention, perception, judgment, and decision.

SINCE 1867

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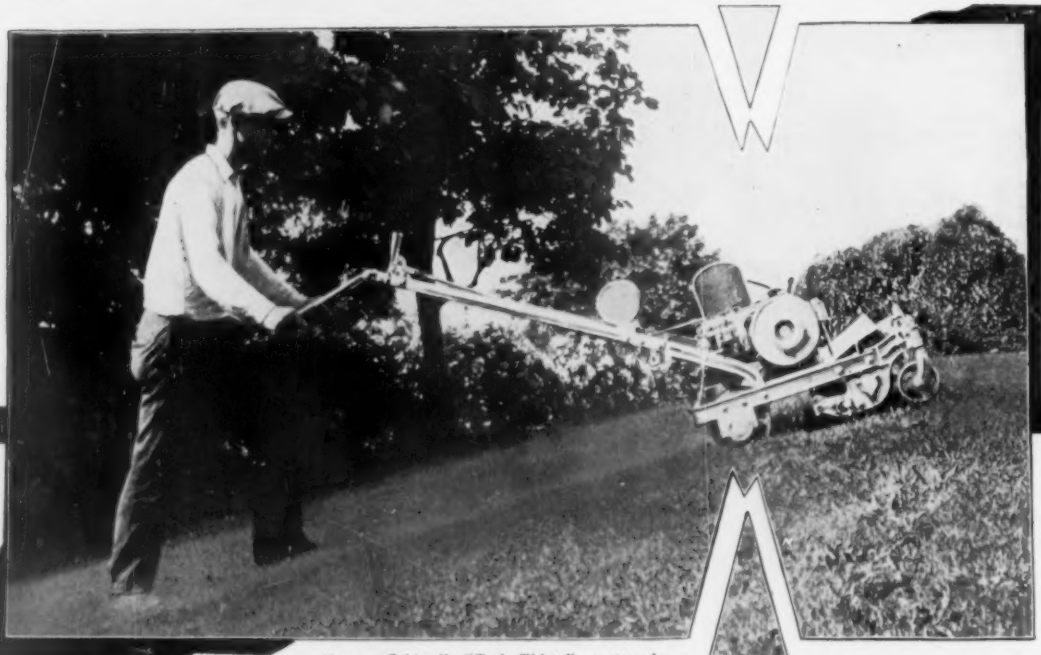

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More Than 30 Years of Leadership

COLDWELL leadership is the result of more than 30 successful years in building DEPENDABLE power lawn mowing equipment for America's finest lawns.

Present models are designed along modern lines. An abundance of power coupled with flexibility and simplicity of operation gives you at last a power mower any workman can operate successfully. Built to produce finest results with the minimum of expense.

Let us demonstrate on your own grounds.

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Bridges on secondary highways need not be as strong as those on roads where heavy trucks are constantly passing.—A motor-truck and its load of oil, etc., weighed about 18,000 pounds. As it was being driven across an old bridge on a by-road near Beaver, Pa., the bridge collapsed. The owner and the driver of the truck sued the county for damages, but the Pennsylvania Supreme Court decided that there was no liability. (*Freedom Oil Works Co. v. Beaver County*, 148 Atl. 67.) After remarking that the county commissioners "were not compelled to provide, for that particular locality, a bridge capable of carrying the enormous vehicles and loads customarily using paved and much-traveled great highways," the Court added:

"The accountability of county commissioners does not extend to the point of practically making them insurers against accidents happening to persons using county bridges. If they examined the bridge with ordinary care and made all repairs that, on such examination, were thought by themselves and their mechanics, acting in good faith, to be needed, they cannot be charged with negligence and the county made liable. . . . The element of mutuality of care enters into consideration of a controversy similar to the present one, and a duty of watchfulness imposed itself upon plaintiffs. They were thoroughly familiar with the bridge, had driven over it numerous times, and it could properly be expected of them that they give thought to the probability of the structure not bearing the unusual and excessive weight they were placing upon it."

Private subscription influencing selection of a public building site held valid.—Certain taxpayers of San Bernardino, Calif., signed a subscription agreement to contribute to the expense of a particular site for a court house. One of these subscribers, however, repudiated the obligation on the ground that the contract was void as being against public policy. It was argued that such an agreement unduly interfered with the county supervisors in the discharge of their duty to the public, by inducing the selection of a site selfishly sought by the subscribers.

But the California District Court of Appeal upheld the agreement and the county's right to recover, saying in part (*San Bernardino County v. Gate City Creamery Co.*, 284 Pac. 457):

"Other things being equal, it would clearly be the duty of the board to select the site which could be obtained at the least expense to the public. Of two locations offered, otherwise equally desirable, one at the full market value of the property, and the other as a donation, irrespective of the fact that the motive for the gift might be a selfish and self-serving one, it would be clearly the right and duty of the official body to accept the offered donation. What difference in principle is involved if a part or if the whole of the cost of a building site is tendered by a subscription from individuals who expect a profit by a location?

"We have examined each of the numerous authorities cited by counsel in this case and find that in most of the decisions where the location of a public building has been influenced by private contributions to the cost, and the transaction held to be against public policy, the circumstances have been such that the contribution offered or suggested some personal gain or benefit to the officials having the decision in hand."

Important Legal Decisions

involving municipalities as reported in this department during 1929, are indexed and classified in the 1930 MUNICIPAL INDEX. This reference list, commencing on page 151 of the new INDEX, supplements lists appearing in the 1929 and 1928 volumes, and covering all decisions reported in this department since its inception in 1924.

City held empowered to amend street-railway franchise by permitting substitution of motor-busses.—The right of the city council of Paducah to amend an unexpired street-railway franchise by permitting the substitution of motor-busses for electric street cars on certain streets was upheld by the Kentucky Court of Appeals in the case of *Russell v. Kentucky Utilities Co.*, 22 S. W. 2d. 289. Overruling objections made by taxpayers, the Court observed in part:

"Is the substitution of cars running on rubber tires, free from limitations of steel rails and trolley wires, and propelled by internal-combustion engines, in place of cars with metal wheels without tires on fixed rails, and propelled by electric motors supplied with power through overhead wires, such a radical departure from the purposes and objects and terms of the original franchise as to preclude the change? If busses be used for the transportation of passengers, there is no additional servitude on the streets or obstruction to the free and safe use of the streets by other vehicles. On the contrary, the streets are relieved of trolley poles and wires and the imbedded rails, more or less dangerous. It can hardly be said that the operation of the busses is more dangerous or obstructive than the operation of electric street cars on the thoroughfares. The problem is one of distinction between the essence in which the permanent value lies—the use of streets for transportation of passengers for hire—and the incidents of that franchisal right which are subject to change by agreement, viz., the facilities to be used.

"The case is analogous to the line of cases rendered several years ago during the transition from horse cars. . . . To meet the demands of modern life, the courts held the right of substitution existed, unless the franchise clearly, and explicitly confined the motive power to horses or to some mechanical means."

A dump for ashes, street sweepings, etc., by proper method, held not an abatable nuisance.—In the case of *Storm v. City of New York*, 238 N. Y., Supp. 143, plaintiffs failed to secure an injunction against the city's maintenance of a place at the foot of East 72nd Street, where ashes, etc., are dumped into scows for further removal. Plaintiffs, owners of a lumber yard, complained of dust blowing from the dump. But the Court found that the location was a suitable one for a dump and that the equipment was of up-to-date construction. The opinion observes:

"I cannot conceive of the operation of a public dump without some inconvenience and discomfort being suffered by some individuals, and it would be impossible to cite an instance where such a desired condition has been attained. But the general health and comfort of the inhabitants of the city require the operation of dumps, and, if the manner and method adopted in the conduct of such operation are in keeping with the best known methods, which seems to be the case in the present instance, the right to do so must be supported. Whether or not the maintenance of a dump constitutes a nuisance does not depend upon the nature of the structure, but rather upon the method of its use. Of course, each case will have to stand upon its own facts."

Distinguishing features of streets and boulevards judicially noted.—It having been determined in Michigan that paving of boulevards must be paid for out of public tax revenues, although local assessments may be levied for the improvement of streets, it became necessary in the case of *Oprisiu v. City of Detroit*, 227 N. W. 714, to decide whether a certain thoroughfare was a street or a boulevard. Plaintiffs lost in their endeavor to convince the Court that their property could not be assessed for paving because the way was a boulevard and so designated on a plat on file in the office of the register of deeds. The Court observed:

"The paving of a boulevard is not a local improvement; a city may not, after annexation, change the designation of boulevards to streets, and thus render lot

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owners liable to special assessments for paving; determination as to whether a certain highway is a street or boulevard does not depend solely upon the name given to it on the plat, but is dependent upon its physical aspect, its width, its length, provision for giving it a park-like appearance by reserving spaces at the sides or center for shade trees, etc. The question here presented is whether this street is a boulevard in fact.

"While the name given to it on the plat and its approval by the proper authorities may be said to *prima facie* establish its character, this may be overcome. It is somewhat significant that in the dedication it was referred to as a street. . . . It now extends a distance of two miles, and in the connecting plats is stated to be an avenue. It is narrower than any of the streets involved in the cases above cited, and has none of the characteristics of a boulevard. It has been treated as a street since taken into the city in 1916, and, while the petition for its pavement, signed by plaintiffs' grantor, does not preclude him from resisting liability for the special asssessment, . . . it clearly indicates that these lot owners had no thought in mind at the time of their purchase that their lots would be relieved from the expense incident to such paving."

Osteopath held eligible for health office as "legally qualified physician."—One licensed as osteopath and surgeon is qualified to be city health officer under Remington's Washington Statutes, sec. 6092, as a "legally qualified physician," according to the view taken by the Washington Supreme Court in the case of *State v. Dean*, 284 Pac. 756. The Court said:

"It must be remembered that section 6092, supra, is not an act authorizing any one to practice medicine and surgery. In so far as the subject-matter of this inquiry goes, the act simply states the professional qualifications required for a certain office. It may be noted that cities of the first class are excepted from the operation of that section, and no act has been called to our attention prescribing any qualifications whatever which must be possessed by a person named as health officer of a city of the first class."

Bank held liable for funds obviously misappropriated by trustee in depositing them to his personal account.—A bank not a township depository may be held liable to the township for cashing warrants for the township trustee and depositing them to his own personal account, if the bank knew or ought to have known that a misappropriation of the funds was being accomplished. That is the substance of the decision rendered by the Appellate Court of Indiana in the case of *State v. Citizens National Bank*, 168 N. E. 488. Said the Court:

"Each of the warrants here involved showed on its face that it constituted part of the trust funds for Lincoln school township. Appellee [the bank] being charged with knowledge of the law, as aforesaid, knew then that it was Place's duty to take such warrants, and each of them, without changing them into other funds, or into cash, and without causing them to lose their identity to one or the other of the depositories named, and deposit them for collection to the trust funds of the township, and in the name of the township. Place, as such trustee, was but a special agent of the township, and clothed with a very limited authority, and appellee at his [its] peril must know whether he was acting within his authority."

Taxpayer may restrain use of municipal radio for private purposes.—Whether or not a complaint of a taxpayer, seeking to restrain use of New York's radio broadcasting station WNYC for broadcasting proceedings at unofficial and private gatherings, stated a cause of action, was the question presented to the Appellate Division of the New York Supreme Court in the case of *Ford v. Walker*, 237 N. Y. S. 545.

The Court held that the complaint stated a right, if proved, to restrain similar use of the station in the future. The opinion says:

"The city has no right to use its money for private purposes (constitution of the state of New York, art. 8, sec. 10). The Board of Estimate and Apportionment was careful not to violate this provision when it adopted the resolution authorizing the construction of the broadcasting station. The resolution distinctly provided that that station was to be used as an adjunct to the Police and Fire Departments and to such other departments 'as may require or use such service.' In the absence of further action by the Board of Estimate and Apportionment, the city may expend funds for the maintenance of the broadcasting station only in so far as it is used for the purposes set forth in the resolution authorizing its construction."

Water user must pay cost of extension of main when return would be very inadequate.—The Court of Common Pleas for Schuylkill County, Pa., refused to compel water commissioners to make an expensive extension of a water line in a narrow street to serve a single consumer, saying (*Bachert v. Tamaqua Borough Water Commissioners*, 21 Pa. Munic. Law Rep. 59):

"We do not think the defendant officials have abused their discretion in refusing to put in a pipe-line at the expense of the borough alone. . . . The act under which the defendants operate the water-works of the borough gives them the power to establish the 'conditions upon which water will be furnished to applicants.' Now, since all other customers in the borough paid for their service lines, the plaintiffs are obliged to do the same. 'Where a consumer desires service, which a city can supply only by the installation of apparatus at a substantial expense not entailed in furnishing service to others, the special expense thereof must be borne by the consumer': 20 Corpus Juris, Sec. 30, page 337. . . .

"The cost of putting in a service pipe would be around $600, whereas the gross return would be but $11 a year. In *Horst v. Heidelberg Township Water Co.*, 15 Pa. Corp. R. 264, the defendant refused to extend its main 316 feet at a cost of $500 to serve two properties from which the returns would be $29.20 per year, and the plaintiff's petition was dismissed because the demand was unreasonable. In *Fritz v. Allegheny Water Co.*, 15 Pa. Corp. R. 265, a like disposition was made of the cost because the extension required was 372 feet from the main at a cost of $800, with a return of only $14."

Public contractor's bond held not required of engineer employed to make survey.—A statute, requiring those contracting with the state or a county or municipal corporation to give bond to pay for labor and material used, does not apply to the employment of an engineer to make a survey of a city water system, held the Georgia Court of Appeals in the case of *Booker v. Mayor and Aldermen of Milledgeville*, 150 S. E. 652.

City and contractor held jointly liable for property damage resulting from inherently dangerous plan of a sewer.—Judgment against the city of Los Angeles and a contractor, for damages resulting from shifting of the soil of private property in the construction of a sewer, was affirmed by the California Supreme Court in the case of *Kaufman v. Tomich*, 280 Pac. 150. But the decision rested upon a finding from the evidence "that the plan and location of the sewer was *inherently* dangerous."

Charging small fee for bathing suits does not make a city liable for accident on municipal beach.—Even if defendant city was at fault for an injury sustained by plaintiff, a bather at one of its municipal bathing beaches, when his head struck some unidentified object as he dived into the water, the city was not liable, because maintenance of the beach was a governmental function. (*St. John v. City of St. Paul*, 228 N. W. 170, decided by the Minnesota Supreme Court.) Plaintiff sought to distinguish this case from a previous decision, in which it had been held that a city was not liable for such accidents, by showing that he paid 25 or 30 cents for the use of a locker, towel, bathing-suit and soap. But the Court said:

"The lake and the diving scaffold and board were for the free use of plaintiff. Had he come with his own bathing suit, towel, and soap he could have dived and made use of the lake without any charge whatever. No distinction as to right of recovery can or ought to be made between one who supplies his own necessaries when enjoying bathing privileges in a public park and one who rents such necessaries or buys them from the municipality. The fact that the city provides for a price the things needed by those making use of a public bathing beach should not change the city's legal responsibility for negligence in the maintenance of its public parks. It appears without contradiction that the city paid out more to provide guards and the rented and purchased facilities for those who availed themselves of the bathing beach than it received from that source."

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MUNICIPAL AND CIVIC PUBLICATIONS

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A Traffic Officer's Training Manual

By Clarence P. Taylor, Sometime Albert Russel Erskine Research Fellow, Harvard University, and formerly in charge of traffic work for the Berkeley, Calif., Police Department. Edited by Miller McClintock, Director, The Albert Russel Erskine Bureau for Street Traffic Research, Harvard University; with a Foreword by August Vollmer, Chief of Police, Berkeley, Calif., and Professor of Police Administration, University of Chicago. Published by the National Safety Council, 20 N. Wacker Drive, Chicago, Ill. 1930. 232 pages, including 25 illustrations and tables. Pages 4¼ by 7 inches; flexible leatherette cover. Single copies $2.00; lower prices in quantities.

This book represents a remarkably successful attempt to meet, within the covers of a manual which can be slipped into a fairly capacious pocket, the threefold need for: (1) a practical guide for policy-determining officials as to the best current practice in traffic regulation, accident prevention and law enforcement; (2) a handbook to aid police chiefs in their work of administration; and (3) a manual which will be useful in the education or self-training of individual traffic officers. Because of the wide variation in state laws and municipal ordinances, no publication can meet perfectly needs 2 and 3; but the number of rules and principles of universal application is great enough to make the new manual of great practical value to every man at headquarters or on the street who has the intelligence and ambition to render real service in traffic control.

The broad scope of the manual is indicated by the titles of the fourteen chapters: The Nature of the Traffic Problem; Control at Intersections; The Parking Problem; Crowds, Processions, Fires The and Disasters; Headlights; Mechanical Defects and Equipment; Other and Miscellaneous Law Enforcement Problems; Handling of Violators; Prevention; Accident Report Forms, Statistics and Traffic Hazard Investigations; Accident Investigations; Investigation and Preparation of Criminal Cases; Court; Human Relations. There is also an appendix on Aviation Law Enforcement and an excellent alphabetical index.

Municipal Organization for Street Traffic Control

Publication No. 16 of the Municipal Administration Service, by Miller McClintock, Director of the Albert Russel Erskine Bureau for Street Traffic Research, Harvard University, and Sidney J. Williams, Director of the Public Service Division of the National Safety Council, is a 28-page pamphlet which summarizes and discusses recent developments in municipal organization for devising and enforcing traffic rules and regulations. In the first section the organization of traffic engineering work in ten large cities is described in some detail with charts of the Pittsburgh Bureau of Traffic Planning and the District of Columbia Traffic Department. The second section deals with police functions. The third contains a useful discussion of various types of violations bureaus. A bibliography is included. 35c. (Apply to Municipal Administration Service, 261 Broadway, New York.)

Roads of Safety

A Pictorial Manual of Legal and Safe Driving. This instructive booklet "is issued in the interest of saving lives and avoiding injury to human beings" by the Automoble Club of Missouri. Photographs illustrate the rules of the road and what happens when they are not followed. The services of the Automobile Club of Missouri are also described. 64 pp. 25c. (Apply to the Club, 4228 Lindell Blvd., St. Louis.)

Billboards and Highway Safety

A plea for the removal of highway billboards in the interest of safety, this folder is illustrated by photographs of some of the hazards caused by these obstructions. 4 pp. Printed for the National Council for Protection of Roadside Beauty by the American Nature Association of Washington, D. C. (Apply to the Association.)

Texas Water-Works Short School Proceedings

The 12th Annual Session of this school, which was held under the joint auspices of the Texas Section of the Southwest Water Works Association, the Texas State Department of Health, the city of Abilene, Simmons University and the Abilene Chamber of Commerce, at Abilene, Texas, January 27-30, is reported in a 188-page paper-bound booklet. In addition to the minutes and summarized proceedings, there are various lectures and addresses, given at the school. They are divided into two sections: Water, including 18 titles, and Sewage, including 10. Water-works accomplishments and problems in various cities are presented, as well as discussions of many topics of general application, such as cross connections, sanitary control of sources, taste and odor elimination, pumping, stand pipes and tanks, and chlorination. The section on sewage includes papers on progress in sewerage and sewage disposal in Texas and elsewhere, sewer grades, gases and bacterial growth, sludge, creamery wastes, financing connections, and rural sanitation. $1.00. (Apply to E. G. Eggert, Secretary, Texas Association of Sanitarians, Capitol Station, Austin, Texas, or American Public Health Association, 370 Seventh Ave., New York.)

Boundaries and Adjacent Properties

By Ray Hamilton Skelton, Assistant Professor of Civil Engineering, University of Maryland. Bobbs-Merrill Co. 1930. 580 pp. $5.00 from THE AMERICAN CITY.

A handy-size volume giving in concise form the legal principles underlying the application of surveying to the location of boundaries. This book will fill a valuable place in the library of the lawyer who writes deeds and the engineer who attempts to lay down the lines of a property, giving both the mathematics and the law involved. The purpose of the book is to bring to the engineer an appreciation of the legal elements of boundary surveying and to the attorney a realization of the fact that the prevention of boundary disputes can be obtained only by the application of modern methods of controlled surveying. The various chapters cover boundary control, the relative importance of conflicting elements, excess and deficiency, highways and streets as boundaries, riparian boundaries, establishment of boundaries, adverse possession, dedication, and adjoining landowners.

Bread

By Harry Snyder. The Macmillan Co. 1930. 293 pp. $2.50 from THE AMERICAN CITY.

Despite the declarations of some of the food faddists, bread is still one of the most important and valuable of nutriments. The proper dietary function of bread, particularly white bread, has been ably set forth in this collection of papers written chiefly for agricultural magazines by the late Professor Snyder of Minneapolis. In addition to the chapters on the various phases of bread, flour, and wheat, there is a biographical sketch about the writer, who died in 1927, contributed by A. L. Winton. Persons desiring to know the real place of bread in human nutrition will find this book of interest and value.

JAMES A. TOBEY.

Sleep: Why We Need It and How to Get It

By Donald A. Laird, Ph.D., Sc.D., and Charles J. Muller. John Day Co. 1930. 214 pp. $2.50 from THE AMERICAN CITY.

This interesting book is more than a mere treatise on sleep, for it deals entertainingly with other phases of personal hygiene, such as fatigue, rest, and relaxation, mental attitudes, and the physiological effects of noise. The skillfully presented information is authentic, being founded largely on scientific experiments in the psychological laboratory at Colgate University. The book is well arranged and well printed, and has a style which will commend it to the general reader.

JAMES A. TOBEY.

Recent Trends in American Municipal Government

The "problems" in city government are often caused by no more than neglected opportunities. Because administrators are likely to be so preoccupied with the immediate tasks at hand, they are unaware of larger trends and developments. To present a brief survey of these movements, Clarence E. Ridley, editor of *Public Management*, the publication of the International City Managers' Association, has assembled ten articles, by competent authorities, which have appeared in *Public Management*. 38 pp. $1.00. (Apply to the Association, 923 E. 60th St., Chicago, Ill.)

Making One Government Grow Where Two, or a Dozen, Grew Before

Tax Commissioner Mark Graves of the state of New York, is the author of a 3-page article available as a reprint from the *Community Service Magazine*, reviewing the present situation of overlapping and coextensive units of local government, and suggesting certain benefits to be realized from consolidation. Practical suggestions for reform are given. (Apply to State Department of Taxation and Finance, Albany, N. Y.)

Dayton's Sixteen Years of City Manager Government

Subtitled "An Appraisal of a Pioneer Venture," this 24-page pamphlet is a reprint of an article by Arch Mandel and Wilbur M. Cotton from the *National Municipal Review*. It will be of particular value to those investigating the city manager plan. (Apply to the *Review*, 261 Broadway, New York.)

The Financing of Local Improvements by Local, Borough, or City-Wide Assessments

In a report to the Board of Estimate and Apportionment of the City of New York, by Comptroller Charles W. Berry, procedure governing assessments for local improvements is discussed with particular reference to the New York situation. Recommendations are made for the correction of current practice. 55 quarto pp., indexed. (Apply to the Board.)

Zoning Uses of Buildings

The Research and Statistical Bureau of the Philadelphia Chamber of Commerce has issued under the above title a 44-page mimeographed study based upon ordinances in effect in cities, and reports of outstanding authorities. It is a compilation that will prove invaluable to officials approaching the problem of outlining a zoning ordinance. (Apply to Chamber of Commerce, Twelfth and Walnut Sts., Philadelphia, Pa.)

How Much Property Should Be Zoned for Business? To What Extent Are Apartments Justified in Suburban Villages? What Power Has the Zoning Board of Appeals?

Three papers on zoning, delivered at the annual meeting of the Chicago Regional Planning Association, are available in a 12-page pamphlet form under the general title, "Problems in Zoning." The authors are Lawrence V. Sheridan, Indianapolis City Plan Consultant; Coleman Woodbury, Institute for Research in Land Economics, Chicago; and Jacob L. Crane, Jr., respectively. (Apply to the Association.)

Can Blighted Urban Areas Be Rehabilitated?

In this address read before the National Association of Real Estate Boards in Toronto in July, Harland Bartholomew, city plan engineer, of St. Louis, Mo., states: "The blighted urban area is the result of uncontrolled large scale urban growth. It can be corrected and prevented only by control of unsound speculation and the promotion of those forces which create permanent values." 20 pp. (Apply to Mr. Bartholomew.)

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American Civic Annual, 1930

Edited by Harlean James, Executive Secretary, American Civic Association. American Civic Association, Washington, D. C. 350 pp. $3.00.

Volume II of this important record of public improvement progress represents a substantial gain in size, and also in the number of articles and contributors, over the 1929 volume, though the latest volume covers a period of only one year, while the earlier reviews events of a quarter-century. The material is presented under four main topical heads: The Nation as a Whole, including National Parks, the Housing Problem, and the Federal City; Regional Planning Progress; Work in the States, including State Planning and Parks, Famous Highways, State Capitols and Roadside Improvement; and Progress in Cities and Towns.

The book is notably and predominantly a history of recent land-planning progress. The section of cities and towns contains a running review of accomplishments in city planning, followed by almost a score of accounts from cities; the Regional Planning section, broadly geographic in scope, includes articles about New York, Los Angeles, Lucas County, Ohio, and Cleveland; and added to these is the group of articles on various phases of the Federal City; and an account of Colonial Williamsburg, now being revived as a national historic shrine.

A new feature of this year's volume is a Who's Who of Contributors; there are sixty-odd of them. The Who's Who in Civic Achievements is again included and represents the ever growing list of American Civic Association members, with a brief record of the contribution of each in this field.

Landscape Architecture: Twentieth Anniversary Number

The July, 1930, issue of this dignified and splendid publication is a birthday celebration number, in which a notable group of landscape architects and workers in related fields discuss the two decade of progress since 1910. Landscape design as a matter of increasing public importance, in city planning and park planning and in the preservation and enhancement of public scenic beauty, is presented in articles by Stephen Child, Frederick Law Olmsted, J. Horace McFarland, Harold S. Buttenheim, Warren H. Manning, and Harold A. Caparn. Henry Vincent Hubbard, Editor, describes "Twenty Years Adventuring," and Katherine McNamara presents "A Retrospective Bibliography of Books on Landscape Architecture, 1910-1930." 115 reading pages, illustrated. 75c. (Apply to the magazine, 9 Park St., Boston, Mass.)

Letchworth: England's First Garden City

The June-July issue of *Garden Cities and Town Planning* is devoted to the history of Letchworth's development to date, presented in editorial and feature-article form. Public services, industries, housing, local government, and transportation development are reviewed, as are the inception of the garden city idea and the growth of this pioneer plan. 46 pp. Illustrated. 6d. net. (Apply to the Garden Cities and Town Planning Association, 3 Gray's Inn Place, London, W.C. 1, England.)

Police Radio Specifications

The Central Board of Purchasers of Milwaukee have drawn up a clean-cut and comprehensive set of specifications covering municipal radio equipment and installation and automatically excluding irresponsible bidders. The specifications, with little change, are applicable anywhere. 8 pp. multigraphed. (Apply to THE AMERICAN CITY.)

A Model County Manager Law

Submitted by the Committee on County Government of the National Municipal League, and published as a supplement to the August issue of *National Municipal Review*, this model law represents, in the opinion of members of the committee, the first practical step to be taken toward a solution of the problems of county government. 17 pp. (Apply to National Municipal League, 261 Broadway, New York.)

A Little Manual for Motorists

Bulletin No. 73 of "Essential Information in Condensed Form" is prepared by Malcolm D. Rudd, Deputy Commissioner of the Department of Motor Vehicles in Connecticut, for the benefit of Connecticut drivers. 32 pp. (Apply to the Department, Hartford, Conn.)

Aeronautical Law

By W. Jefferson Davis, author of "Radio Law." Parker, Stone & Baird Co. 579 pp. $10.00 from THE AMERICAN CITY.

In preparing a volume on this subject the principal difficulty lies in the fact that an author can find but a very limited number of court decisions to guide him. U. S. Aviation Reports, which include all the decisions of our state and Federal courts relating to the law of aviation between the years 1922 and 1930, contain only 21 cases decided prior to the year 1919, and only 60 cases during the years 1919 to 1929 inclusive. The question suggests itself as to whether in the present state of development of aviation law a textbook on the subject can be of any constructive help to those interested. Most of the legal problems arising from time to time can be solved by a reference to established principles of law in other clearly defined branches of our jurisprudence. By way of illustration, the principles of the law of negligence, nuisance and trespass can readily be applied to the solution of many legal problems arising in connection with the operation of aircraft.

More than 200 pages of this book are devoted to setting forth verbatim the Air Commerce regulations, the International Convention relating to the regulation of aerial navigation, the Airport Rating regulations, the Air Commerce Act and other statutes and regulations, all of which are readily available to those interested in other form. The remaining pages contain numerous quotations from reports of bar associations and committees, which, while interesting, can not be relied upon in solving the legal problems that will be presented in connection with the development of aviation. Some of these problems are suggested by the author, but in several instances he fails to answer the questions which he raises.

The chapter on "Aircraft as Common Carriers" presents a most important question, and this chapter is of considerable interest. It is doubtful, however, whether the industry as a whole will receive with any enthusiasm the author's suggestion for the establishment of an Interstate Air Commerce Commission. The book contains much interesting information on the subject, but it is lacking in original thought so necessary in solving the questions of law which will be presented as a result of the rapid development of the aviation industry and the more extensive operation and maintenance of aircraft.

J. HARLIN O'CONNELL.

Is Smoke Responsible for Property Damage?

R. D. MacLaurin, Commissioner of Trade Waste, Cleveland, Ohio, in this 3-page reprint from *Chemical and Metallurgical Engineering* for March, 1930, gives statistics of the content of smoke particles in polluted atmosphere, and by photographs shows the effect of microscopic smoke particles on different surfaces. (Apply to author.)

Theory of Planning the Region

As Exemplified by the Philadelphia Tri-State Plan. Reprinted from *City Planning* for July, this article by Russell Van Nest Black, former director of Plans and Surveys of the Regional Planning Federation of the Philadelphia Tri-State District, discusses the principles employed in blocking out the form of development that seems to be most adaptable to the Philadelphia Region. 15 pp., including 4 maps. (Apply to Mr. Black, 502 Otis Building, Philadelphia.)

Report of the Passaic County Park Commission, New Jersey: 1928-1929

The first formal report of the Commission, which was appointed by the Supreme Court in 1927 as the result of a referendum authorizing the creation of a county park system with expenditures up to $2,500,000, tells of the beginnings which have been made in establishing units of the ultimate park system. 52 pages, illustrated by photographs and maps. (Apply to the Commission, 45 Church St., Paterson, N. J.)

Order and Beauty in State and City

This address by John Nolen, city planner and landscape architect, at the annual meeting of the Vermont State Chamber of Commerce in Burlington, June 5, contains suggestions for the replanning and development of the state, which although about the size of Switzerland, has less than one-tenth of the population of Switzerland. 4 pp. (Apply to Dr. Nolen, Harvard Square, Cambridge, Mass.)

Problems of Contemporary County Government

By Wylie Kilpatrick. Published by the Institute for Research in the Social Sciences, University of Virginia. 666 pp. $4.00, paper; $5.00, cloth.

This is the eighth and most elaborate volume of an interesting series of studies which the University of Virginia inaugurated in 1928. It is to be followed by fully a dozen more surveys of equally important social, economic and governmental topics. All of these are treated with particular or exclusive reference to Virginia. Dr. Kilpatrick's volume is in fact, as its subtitle calls it, "An Examination of the Process of County Government in Virginia." It is a singularly comprehensive discussion of existing administrative methods in the counties in the state in the light of approved experience elsewhere. Thus it is not a full description of conditions to be found in a typical state, but it is a satisfactory guide to better methods being followed in progressive communities in Virginia and other states. Virginia itself has one county operating under the manager plan. Besides the survey of the typical county functions, there are particularly significant chapters dealing with the problems of area, personnel, physical plant, governmental relationship and the county plan. The whole is elaborately buttressed with footnotes and tables.

The Yardstick of Public Utility Operations and Construction Costs

By Wm. W. Handy. The Williams & Wilkins Co. 1929. 155 pp. $10.00 from THE AMERICAN CITY.

The author, a consulting engineer of Baltimore, presents here certain bases of comparison for electric and gas utilities (excluding hydro-electric and natural gas), and, in the second part of the book, a group of tables and charts showing fluctuations in price levels of construction materials and labor for these utilities. In both parts the data are, in general, for the period from 1911 to January 1, 1929. For the purposes of Part I a group of twenty of the major gas and electric operating companies (not named by the author) was taken as more or less standard, and historical curves worked out representing various significant relationships between investment, revenue, expenses, taxes, bonds, stocks, customers, production, etc., maximum, minimum and average curves being given. While these studies are evidently made chiefly with the viewpoint of the utility companies in mind, some of them are of interest to municipal utility departments, and the price level data may be useful to cities engaged in investigating utility companies.

A Preliminary Financial Analysis as a Basis for a Proposed Joint Bond Program, Hamilton, Ohio: 1930

The Cincinnati Bureau of Governmental Research, at the request of the Hamilton Chamber of Commerce, prepared this 121-page mimeographed study of the three government subdivisions, County of Butler, City of Hamilton, and Hamilton School District, to form the basis of a coordinated bond program. Tables are presented showing the amount available in each projected year, for all the subdivisions, for debt service or capital outlay. (Apply to the Bureau, Cincinnati, Ohio.)

Other Reports Received

ALLEGHENY COUNTY, PA.—Controller's Annual Report, 1929. 541 pp.

CAMBRIDGE, MASS.—Annual Report, Water Board, to March 31, 1930. 47 pp.

CHICAGO, ILL.—Comptroller's Annual Report, 1928. 219 pp.

DUBUQUE, IOWA.—Annual Report, Water Department, to March 31, 1930. 56 pp.

EAST CLEVELAND, OHIO.—Municipal Report, 1929. 40 pp.

EASTON, PA.—Annual Report, 1929. 105 pp.

ERIE, PA.—Survey of the Erie Schools. July, 1930, issue of *Erie Municipal Facts*. 17 pp.

PRINCETON, ILL.—Financial Report, including the Water and Light Plant, for Year Ending April 30, 1930. 10 pp.

ROANOKE, VA.—Statistics of Roanoke, Va. Compiled by the Chamber of Commerce as of January 1, 1930. 1 p.

ROCHESTER, N. Y.—Annual Report of Comptroller, 1929. 92 pp.

Baker Tractor "V" Plow in Action

BAKER SNOW PLOWS

For Motor Trucks and Tractors

Baker Plows Have Served the Nation for Over 20 Years

It is costly to experiment with unknown equipment in the midst of a snow storm. For over twenty years Baker Snow Plows have given real service to the nation. That is why you will find dependable Baker Plows in over one hundred of the leading cities in the snow area, twenty-two State Highway Departments, hundreds of County Highway Departments, industrial plants, parks and cemeteries.

The many models of snow plows include both blade and "V" types for any standard motor truck or leading industrial tractor. The new one-way speed plows are made for both heavy and light trucks including Ford and Chevrolet. The famous Baker Patent Trip Blade Snow Plows with substantial improvements are offered as the last word in blade type snow plows for trucks. The "speed" "V" plows in two models are real snow fighters.

In Baker Tractor Snow Plows, you will find unusual features, both in "V" and blade types—sturdy construction and dependable performance which have made them so popular. If it is a Baker Plow it will make good for you.

Write for Catalog

It will pay you to get the big Baker Snow Plow catalog—56 pages of interesting information on the latest in snow fighting equipment.

The Baker Mfg. Company

503 Standard Ave. Springfield, Ill.

Please send your Snow Plow Catalog.
Interested in snow plows for attachments to

.....

Give name of trucks or tractors

.....

Name

.....

Address 503

Baker Trip Blade Truck Plow

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local)

SEPTEMBER 3-5.—ALTOONA, PA.
Pennsylvania State Association of County Commissioners. Annual convention. Secretary, J. C. Dougherty, Harrisburg, Pa.

SEPTEMBER 8-11.—TORONTO, ONT.
Association of American Cemetery Superintendents. Convention. Secretary, William B. Jones, Superintendent of Highwood Cemetery, Pittsburgh, Pa.

SEPTEMBER 8-10.—HAMILTON, ONT. (110)
Union of Canadian Municipalities. Annual convention. Secretary, Samuel Baker, City Clerk, London, Ont.

SEPTEMBER 9-12.—WINNIPEG, MAN. (1,100)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Fire Chief, Yonkers, N. Y.

SEPTEMBER 13.—SYRACUSE, N. Y.
New York State Sewage Works Association. Fall meeting. Secretary-Treasurer, A. S. Bedell, Albany, N. Y.

SEPTEMBER 15-18.—AMARILLO, TEXAS. (300)
Southwest Water Works Association. Annual convention. Secretary, Lewis A. Quigley, Fort Worth, Texas.

SEPTEMBER 16-18.—QUEBEC, QUE. (300)
Canadian Good Roads Association. Annual convention. Secretary-Treasurer, George A. McNamee, New Birks Building, Montreal, Que.

SEPTEMBER 16-18.—BAY CITY, MICH.
Michigan Municipal League. Annual convention. Director, Harold D. Smith, University of Michigan, Ann Arbor, Mich.

SEPTEMBER 17-19.—FORT WORTH, TEXAS. (800)
County Judges and Commissioners of Texas. Annual convention. Secretary, Thomas B. Smiley, Karnes City, Texas.

SEPTEMBER 17-19.—COLUMBUS, IND. (200)
Municipal League of Indiana. Annual convention. Executive Secretary, Frank G. Bates, Indiana University, Bloomington, Ind.

SEPTEMBER 22-25.—ATLANTIC CITY, N. J.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 22-24.—BEAUMONT, TEXAS. (350)
Chiefs of Police and City Marshals Association of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

SEPTEMBER 23-26.—MILWAUKEE, WIS. (150)
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, New Orleans Court Building, New Orleans, La.

SEPTEMBER 24-27.—SAN FRANCISCO, CALIF. (150)
International City Managers' Association. Annual convention. Executive Secretary, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

SEPTEMBER 25-26.—PATERSON, N. J. (500)
New Jersey State League of Municpalities. Convention. Executive Secretary, Sedley H. Phinney, 34 West State Street, Trenton, N. J.

SEPTEMBER 29-OCTOBER 2.—ST. LOUIS, MO. (275)
American Institute of Park Executives and American Park Society. Annual convention. Executive Secretary, William H. Walker, 1310 Tecumseh Avenue, South Bend, Ind.

SEPTEMBER 29-OCTOBER 2.—ST. LOUIS, MO. (400)
American Association of Zoological Parks and Aquariums. Annual meeting with the American Institute of Park Executives and American Park Society. Secretary, Will O. Doolittle, Box 422, Tulsa, Okla.

SEPTEMBER 29-OCTOBER 2.—KELOWNA, B. C.
Union of British Columbia Municipalities. Annual convention. Secretary, A. W. Gray, P. O. Box 580, New Westminster, B. C.

SEPTEMBER 29-OCTOBER 3.—PITTSBURGH, PA. (5,000)
National Safety Council. Annual Safety Congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 1-3.—ST. LOUIS, MO. (450)
American Society of Civil Engineers. Fall meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

OCTOBER 6-10.—LONG BEACH, CALIF. (1,500)
California Conference on City Planning. Secretary, C. J. S. Williamson, Chamber of Commerce Building, Los Angeles, Calif. *Joint meeting with the League of California Municipalities.* Executive Secretary, William J. Locke, 1095 Market Street, San Francisco, Calif.

OCTOBER 6-11.—ATLANTIC CITY, N. J. (600)
National Recreation Association. Annual convention. Secretary, Howard S. Braucher, 315 Fourth Avenue, New York.

OCTOBER 6-7.—BISMARK, N. DAK. (100)
League of North Dakota Municipalities. Annual meeting. Executive Secretary, Myron H. Atkinson, Bismark, N. Dak.

OCTOBER 6-11.—WASHINGTON, D. C. (2,500)
Permanent International Association of Road Congresses. Sixth International Road Congress. Secretary General, Thomas H. MacDonald, American Organizing Committee, 1723 N Street, N. W., Washington, D. C.

OCTOBER 7-10.—WASHINGTON, D. C. (2,500)
American Road Builders' Association. International Exposition of Highway Equipment and Material. Secretary-Director, Charles M. Upham, National Press Building, Washington, D. C.

OCTOBER 7-10.—MADISON, WIS. (1,500)
American Country Life Association. Conference. Executive Secretary, Benson Y. Landis, 105 East 22nd Street, New York.

OCTOBER 7-10.—WILMINGTON, N. C. (450)
Atlantic Deeper Waterways Association. Annual convention. Address: A. D. W. Association, Widener Building, Philadelphia, Pa.

OCTOBER 7-10.—RICHMOND, VA. (500)
Illuminating Engineering Society. Annual convention. General Secretary, A. B. Oday, 29 West 39th Street, New York.

OCTOBER 8-9.—SWAMPSCOTT, MASS. (200)
Massachusetts Police Association. Annual convention. Secretary, John H. Shaughnessy, West Newton, Mass.

OCTOBER 8-9.—MILWAUKEE, WIS. (200)
Wisconsin Chiefs of Police Association. Annual meeting. Secretary-Treasurer, R. H. McCarty, Police Department, Kaukauna, Wis.

OCTOBER 9-11.—LOUISVILLE, KY. (200)
International Association of Street Sanitation Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

OCTOBER 10-16.—LOUISVILLE, KY. (500)
American Prison Association. Annual Congress. General Secretary, E. R. Cass, 135 East 15th Street, New York.

OCTOBER 13-17.—RICHMOND, VA. (200)
American Society for Municipal Improvements. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

OCTOBER 13-15.—HENDERSONVILLE, N. C.
American Water Works Association—North Carolina Section. Annual meeting. Secretary-Treasurer, H. G. Baity, School of Engineering, University of North Carolina, Chapel Hill, N. C.

OCTOBER 16-17.—SPRINGFIELD, ILL. (300)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 16-17.—CORNWALL, ONT.
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary-Treasurer, T. Marshall, Royal Bank Building, Toronto, Ont.

OCTOBER 19-22.—TULSA, OKLA. (325)
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, William J. Russell, Chamber of Commerce of the Borough of Queens, Long Island City, N. Y.

OCTOBER 20-23.—PHILADELPHIA TRI-STATE REGION, PA. (37)
American Civic Association, Inc. Annual meeting. Executive Secretary, Miss Harlean James, 901-03 Union Trust Building, Washington, D. C.

OCTOBER 20-22.—HAYS, KANS. (300)
League of Kansas Municipalities. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 20-24.—KANSAS CITY, MO. (600)
National Tax Association. Annual meeting. Secretary, W. G. Query, Chairman, South Carolina Tax Commission, Columbia, S. C.

OCTOBER 21-23.—LITTLE ROCK, ARK. (55)
National Council of School House Construction. Secretary-Treasurer, William C. Bruce, American School Board Journal, Milwaukee, Wis.

OCTOBER 25-27.—FORT WORTH, TEXAS. (45)
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, U. S. Public Health Service, Washington, D. C.

OCTOBER 27, WEEK OF.—PINEHURST, N. C.
American Institute of Steel Construction, Inc. Annual convention. Executive Director, Charles F. Abbott, 285 Madison Avenue, New York.

OCTOBER 27, WEEK OF.—FORT WORTH, TEXAS. (800)
American Public Health Association. Annual meeting. Executive Secretary, Homer N. Calver, 370 Seventh Avenue, New York.

OCTOBER 29-NOVEMBER 1.—PASADENA, CALIF. (400)
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, L. L. Farrell, 2127 Adeline Street, Oakland, Calif.

OCTOBER 30-NOVEMBER 1.—CHICAGO, ILL. (100)
Civil Service Assembly of the United States and Canada. Annual meeting. Secretary, Fred Telford, 923 East 60th Street, Chicago, Ill.

NOVEMBER 10-12.—CLEVELAND, OHIO.
National Association of Civic Secretaries. Annual meeting. Secretary, Nat Spencer, Citizens' League, Kansas City, Mo.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Governmental Research Association. Annual meeting. Secretary-Treasurer, Russell Forbes, 261 Broadway, New York.

NOVEMBER 10-12.—CLEVELAND, OHIO.
National Municipal League. Annual convention. Secretary, Russell Forbes, 261 Broadway, New York.

NOVEMBER 10-12.—CLEVELAND, OHIO. (100)
Ohio Municipal League. Meeting. Secretary-Treasurer, Harvey Walker, Ohio State University, Columbus, Ohio.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Ohio State Conference on City Planning. Annual meeting. Secretary, Gerald S. Gimre, City Hall, Youngstown, Ohio.

NOVEMBER 10-12.—CLEVELAND, OHIO.
Proportional Representation League. Annual meeting. Executive Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.

NOVEMBER 13-14.—CLEVELAND, OHIO.
American Municipal Association. Annual meeting. Executive Secretary, John G. Stutz, Lawrence, Kans.

NOVEMBER 17-20.—PITTSBURGH, PA. (500)
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

NOVEMBER 19-22.—WASHINGTON, D. C.
White House Conference on Child Health and Protection. General session. Chairman, Ray Lyman Wilbur, Secretary of the Interior, Washington, D. C.

DECEMBER 1-5.—MEMPHIS, TENN. (850)
The Asphalt Institute. Ninth Annual Asphalt Paving Conference. Managing Director, J. E. Pennybacker, Crystal Building, 801 Second Avenue, New York.

DECEMBER 1-5.—MEMPHIS, TENN. (850)
Association of Asphalt Paving Technologists. Meeting in conjunction with the Ninth Annual Asphalt Paving Conference of The Asphalt Institute. Secretary-Treasurer, C. A. Mullen, 980 Saint Antoine Street, Montreal, Que.

JANUARY 12-16.—ST. LOUIS, MO. (25,000)
American Road Builders' Association. Annual meeting. Secretary-Director, Charles M. Upham, National Press Building, Washington, D. C.

JANUARY 12-16.—ST. LOUIS, MO. (25,000)
American Road Builders' Association—County Highway Officials Division. Annual meeting. Executive Engineer. Charles E. Grubb, National Press Building, Washington, D. C.

Good Roads
MACHINERY
"GOOD ROADS" CHAMPION SNOW PLOWS
In various models to meet any condition of high-speed snow removal
Model 25 . . . Reversible Blade Type, with 10 ft. long blade, 36" high . . for trucks of 2½ tons capacity and heavier.
Model 21-B . . . Super High-Speed Highway Plow, cutting width adjustable from 11 to 16 ft.
EFFECTIVE SIMPLICITY. Characterizes all "Good Rodas" Champion Snow Plows. Easily and quickly attached to any standard make of truck or bus . . . from 1 ton capacity to heaviest built.

The *Good Roads* Machinery Co. Inc.

"Snow Plow Headquarters"

KENNETT SQUARE, PA.

Sales Branches

PHILADELPHIA — NEW YORK — PITTSBURGH — CHICAGO
HARRISBURGH, PA. — WATERTOWN, MASS. — FRANKFORT, KY.

Why not remember to mention THE AMERICAN CITY?

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

An Emergency Truck for Airport Service

A new piece of motor equipment which has been designed to render fire fighting, ambulance and wrecker service for airports, has been introduced by the Prospect Fire Engine Co., Prospect, Ohio, and is known as the Prospect "Airporter."

This machine may be used as an up-to-the-minute fire-fighting engine, is ready for immediate use as a squad type emergency ambulance, accommodating at least five or six full-grown persons, or can be quickly converted from a squad to a fully upholstered deck emergency ambulance. A full complement of ambulance equipment is provided, including first-aid kit, stretchers, blankets, etc., making possible first-aid treatment to victims at the scene of the accident.

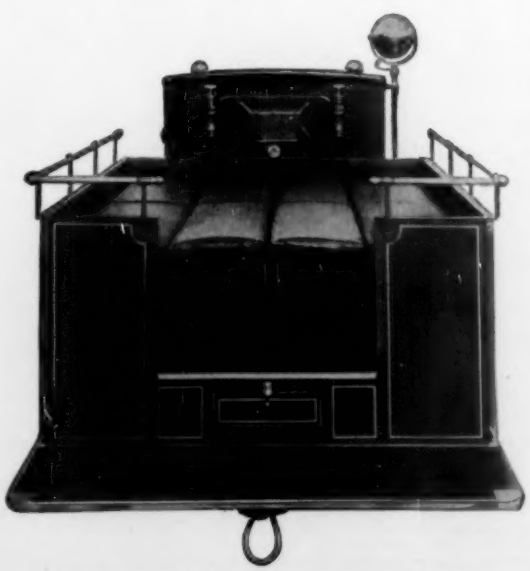
In general airport service, the Airporter can tow heavy ships from any part of the landing field very easily because of the good traction made possible by the use of special dual wheel and tire equipment on both front and rear axles. The disappearing power elevated and operated emergency crane can be used for servicing motors on large planes, as a working platform is mounted on top of the crane boom. It can also be used to tear wrecked ships to pieces or pick them up and tow them.

This machine may be mounted on the specially designed Master Fire Fighter chassis or on any standard commercial truck chassis of suitable wheelbase and axle construction. The body, of the squad type is built of heavy sheet steel, extra-wide and extending to the outside of the rear fenders. Squad type movable padded and upholstered seats on each side run the entire length of the body. The floor board or bottom of the body is covered with rubber matting bound with aluminum molding, the reverse side being padded and upholstered in the same manner as the seats. A mechanical device permits the raising and inverting of this floor so as to expose the padded upholstered side, bringing it to the level of the seats and making a full-width padded and upholstered deck on which five or more persons may be easily laid.

Spacious cupboards are provided in the sides of the body, providing dry and clean storage space for the supplies, hospital equipment, fire-fighting equipment and tools, provided as standard equipment.

A collapsible top of heavy olive-drab waterproof army duck, with integral sides and back, is provided. In the closed position this top fits snugly at the back of the cab, and in the extended position, which is accomplished by means of a lever, the top covers the entire body, rear posts and a snap-on feature holding it firmly in position.

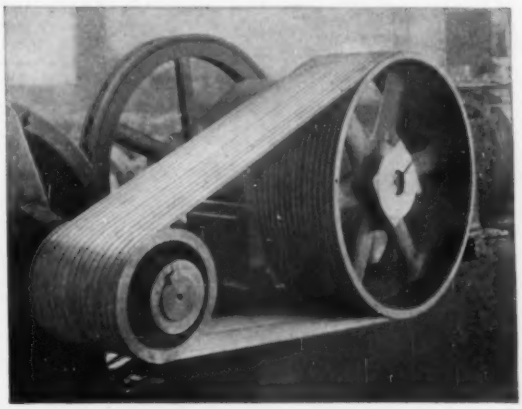
Two spotlights of the interior controlled type, so that the light rays can be cast in any direction, a large N.P. searchlight mounted in a universal bracket above the cab, a special road - clearing flasher signal lighting unit mounted on top of the cab so as to be visible above the ordinary lights on the road, one extension light with 12-foot cord, two large N.P. headlights, stop, tail, dome and instrument board lights, and two waterproof F.D. type electric hand lanterns are also provided.



REAR VIEW OF THE PROSPECT AIRPORTER.

New Committee Secretary

The Standardization and Development Committee of the Cast Iron Pipe Research Association, 309 Peoples Gas Building, Chicago, Ill., has retained J. R. Dangler as Secretary. His office will be at 923 Union Trust Building, Cleveland, Ohio.



THE WORTHINGTON MULTI-V-DRIVE

A New Drive for Power Transmission

After months of study and experimentation in conjunction with the Goodyear Tire & Rubber Co., Akron, Ohio, the Worthington Pump & Machinery Co., Harrison, N. J., has recently placed the Multi-V-Drive on the market. This new drive for power transmission consists of a number of endless molded V-belts running in V-grooved sheaves, and combines a new long-life type of rubberized cord belt impervious to dust and moisture with an improved V-grooved sheave.

The Goodyear Emerald Cord belts used combine in the correct ratio high power capacity, long flexing life, low stretch and accurate cross-section. The load-carrying members are high-grade cotton cords arranged in parallel lines and concentrated about the neutral axis. The rubber is of the highest quality, and each belt takes an equal share of the transmitted load. Each sheave is carefully grooved, machined and finished, so that the grooves present a smooth surface on which the belts run. The wedging action between the belts and the grooves results in a slipless, powerful grip which compensates for, but differs from, initial belt tension in a flat belt drive.

The smooth-grooved construction of this drive, together with the fact that there is an exact mathematical relationship between the grooves and the molded shape of the V-belts, results in an effective conformity of belt to sheave which assures maximum power transmission efficiency. Where this drive is used, there can be no sudden breakdowns, as each application is so engineered that, should one of the belts be ruptured, the remaining belts will carry the load until replacement is made. Multi-V-Drives can be applied to installed equipment, incorporated in new installations, or built into new machinery, as the means of power transmission.

Snow Removal—*Lowers City Street Maintenance Costs*

The Joy Snow Loader in Operation

IT only took the usual amount of traffic after a snow storm, to record the wear shown on this new pavement. Rut following is expensive to the city and can be avoided with proper snow clearance.

Joy Snow Loaders will help you eliminate this condition. They will enable you to get longer life from your pavements and provide smoother roads both winter and summer.

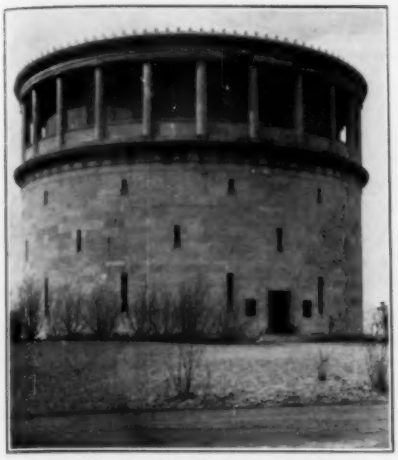
It will pay you to spend a little for snow removal in order to save a lot more in maintenance.

The Joy Snow Loader is both fast and versatile. It moves along a windrow and deposits snow in trucks as fast as they can carry it away—follows inundations—has short turning radius and is economical in operation.

Investigate this modern Snow Loader—see it work and you will be convinced. Specifications upon request.

JOY Manufacturing Co.

Franklin, Penna.



METROPOLITAN WATER-WORKS TOWER AT ARLINGTON, MASS.
This tower contains 16,563 square feet of variegated Indiana limestone and was built in 1923

Limestone for Public Buildings

During the past few years there has been a rapid development throughout the United States in the esthetic sense and the appreciation of architectural excellence in building exteriors, not only of office buildings and apartments in the larger cities, but also of public utilities such as power-houses, water-towers, filtration plants and other municipal engineering structures. The days of unkempt exteriors and rubbish piles surrounding such buildings are gone. These areas have been turned into attractive parks, and the buildings themselves must be in keeping with this new environment.

For this purpose Indiana limestone trim, and even sawed stone facing produced by the Indiana Limestone Co., Bedford, Ind., are being used. This material combines permanent beauty with economy, and by its use city buildings faced with brick, native stone or other materials take on new beauty.

Even when employed merely as a trim, Indiana limestone not only adds to the architectural excellence of buildings, but increases their resistance to water, frost and other elements. It is free from the expansion and contraction due to moisture and insures a dry wall.

The Increased Use of Light Trucks with Trailers and Semi-Trailers

A marked increase in the use of light trucks in combination with trailers and semi-trailers is being reflected in the sales of Model AA truck chassis, according to officials of the Ford Motor Co., Detroit, Mich. This is particularly true, they say, among large fleet owners.

Factors influencing this new trend are economy of operation, ability to maneuver in tight places, and time saved by disconnecting the trailer unit while it is being loaded or unloaded. By using a semi-trailer on a light truck chassis, the major portion of the load can be balanced over the trailer axle with only enough weight over the rear axle of the truck to give good traction. Thus, by taking advantage of the drawbar pull of the truck, 3- or 4-ton loads can be hauled easily by a 1½-ton chassis.

Trailers and semi-trailers can be arranged to meet a wide range of transportation requirements. For heavy loads, dual wheels can be used on a semi-trailer unit and the rear of the truck. When time consumed in loading and unloading is an important factor, two or more trailers or semi-trailers can be used in the operation of each truck, and while one unit is being loaded, the truck can proceed with another. This one chassis, with the extra equipment, can perform the work of two or three trucks.

In some fleets different kinds of trailer units are used with the same truck chassis. For instance, one company uses a detachable tank semi-trailer and a stake-body trailer alternately with a single power unit.

Many city governments are utilizing light truck and trailer units in street flushing, dumping operations, and garbage and refuse collection.

NEW WESTINGHOUSE TYPE TC TITAN LUXSOLITE

New Suspension Type Luminaire

For use with series street lamps of 4,000, 6,000, 10,000 or 15,000 lumens, operating on the secondary of safety coils or with multiple street lamps of 300, 500, 750 or 1,000 watts, the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., has announced the new Type TC Titan Luxsolite, an ornamental suspension type luminaire, designed for bracket mounting.

This fixture is quite simple in construction, consisting of an adjuster tapped with a 1¼-inch pipe, a cast iron canopy, a spun copper case, a globe holder, a globe and a socket mounted on adjustable supports. It is provided with gaskets which render it thoroughly weather- and dust-proof.

The adjuster, which is attached to the canopy, consists of a casting which houses a universal joint. This joint permits the fixture to adjust itself to a true vertical position after it is mounted on a bracket. The globe is hinged to provide accessibility for cleaning and relamping.

Consulting Engineers to Make Extensive Bus Appraisal

Fisk & Roberts, consulting engineers, 82 Beaver Street, New York, have been engaged by the Board of Public Utility Commissioners of the State of New Jersey to appraise the bus property of the Public Service Co-ordinated Transport, Inc. This appraisal is being made as a result of the company's recent application for rate increases and involves the valuation of approximately 2,500 busses and auxiliary equipment. It is the first large-scale bus appraisal to be made in this country.

New Submersible Floodlight Projector

A small submersible floodlight projector which has been introduced by the General Electric Co., Schenectady, N. Y., is applicable not only for swimming pool applications but also in connection with fountain sprays at night.

The unit is of such small size that when installed in swimming pools which have not been provided with recesses for projectors, it does not form an obstruction within the pool. It is 10⅝ inches in diameter, 9 inches deep and weighs 15 pounds. The casing is of cast aluminum, not subject to deterioration when submerged in water. A flexible ball-and-socket pipe fitting is attached to the unit so that it can be adjusted to any desired position.

The optical system consists of the same lens and reflector as used in standard traffic signals, giving a fan-shaped distribution of light which is particularly suited for swimming pools. The beam is directed in such a way that it will not leave the water and cause glare for spectators and swimmers. The unit can be fastened at the top of the pool by means of a ¾-inch standard pipe, hinged at the point of support. To relamp, it is only necessary to pull up the projector by the pipe until it is completely out of the water.

On sprinkling systems, the projector may be installed directly beneath the sprinkler head, and by the use of colored lenses, a beautiful effect can be obtained. When installed in this manner, a lower wattage lamp is used. When the unit is completely submerged, a 250-watt incandescent lamp is used.

THE NEW G. E. SUBMERSIBLE FLOODLIGHT PROJECTOR, SHOWING THE BALL AND SOCKET JOINT WHICH PERMITS ADJUSTMENT TO ANY ANGLE

A NEW IDENTIFICATION MARK

For the UNITED STATES STEEL CORPORATION
and its Subsidiary Manufacturing Companies

THE Subsidiary Manufacturing Companies of the United States Steel Corporation hold in common this simple ideal of service—constantly to seek improvements for their products, and to make these products available on a basis that assures a full measure of value. The new mark here introduced to you stands for this ideal of service and is a sign of quality. In future advertising and promotion work, it will be used in connection with the well known symbols of this Company.

CYCLONE FENCE COMPANY

General Offices: Waukegan, Illinois

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPB'LDG. & DRY DOCK CO.
ILLINOIS STEEL COMPANY
NATIONAL TUBE COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & RAILROAD CO.
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors — Columbia Steel Company, Russ Bldg., San Francisco, Calif.

Export Distributors—United States Steel Products Company, 30 Church St., New York, N.Y.

STEVENS TYPE A-30 WATER-LEVEL RECORDER

A New Continuous Water-Level Recorder

Combining a float-operated pencil with a continuous roll of graduated paper moved by a weight-driven clock, the Stevens Type A30 continuous water-level recorder, made by Leupold, Volpel & Co., 267 Washington St., Portland, Ore., is the result of many years of experience in the designing and manufacture of water-level recording instruments.

The vital parts of the recorder are hermetically sealed when in service, precluding the entry of dust and bugs and largely eliminating errors from expansion and contraction of the paper by humidity changes, an important consideration in moist climates.

The supply roll contains 25 yards of paper, sufficient for a year's record. The paper has perforations on the margin which mesh with spines on the driving cylinder, thus preventing slippage and lateral displacement. The used paper is taken up on a roller turned by a spiral spring belt from the driving cylinder that keeps the paper gently taut at all times.

Another important feature is the non-slip float line of light, non-corrodible metal with small brass balls uniformly spaced on it, the balls matching recesses in the grooved float pulley. The line and balls weigh only 6 ounces per 100 feet, yet the line is strong enough to lift 400 pounds.

The recorder is regularly equipped to run two months with one setting, but may be arranged to run for six months or even a year, if desired.

New Representative for Simplex

The Simplex Valve & Meter Co., 6743 Upland Street, Philadelphia, Pa., has announced the appointment of Goldsborough & Vansant, Inc., Farmers Bank Building, Pittsburgh, Pa., as district representative for the Pittsburgh territory.

A New Portable Sand Drier

For rapidly heating and drying sand or stone for railway and contractors' uses or for reheating pre-mixed and natural asphaltic paving repair materials, the Chausse Oil Burner Co., Elkhart, Ind., has developed a new type portable sand drier or reheater.

It consists of a rotating drum with internal cascading blades, mounted on SKF self-aligning ball bearings and enclosed in a steel housing. The drum is turned by a LeRoi single-cylinder, 4-horsepower, radiator-cooled engine, with Twin Disc clutch and Cotta reducing gear, through hardened roller chain.

An important feature of this machine is the indirect application of heat. The drier is equipped with two Chausse self-generating kerosene burners, located within the steel housing under the rotating drum. These apply the heat effectively on the outside of the drum, and no high-temperature flame comes in contact with the drying or heating materials. This is especially valuable in handling bituminous mixes, which can be very easily damaged in open-flame type heating. It is also important in drying certain mineral sands and aggregates which explode and turn to fine dust if too severely or highly heated.

The machine is mounted on rubber-tired steel wheels, with roller bearings, and has a steel towing tongue. Kerosene is stored in a 30-gallon welded steel tank, and pressure is supplied by a 3-inch hand-operated air pump. It is furnished in several sizes and capacities.

THE NEW CHAUSSE PORTABLE DRIER AND REHEATER

Searight Joins Joy Manufacturing Company

The Joy Manufacturing Co., Franklin, Pa., has announced that William H. Searight, for several years with the American Gas Accumulator Co. as Western Manager, has recently joined its staff as Assistant Sales Manager in charge of snow loading and surface material handling development.

A New Four-Wheel Drive for Tractors

A new four-wheel drive which is sold as a unit for attachment to various standard makes of industrial and farm wheel tractors has a dual, but reversed, differential action which distributes the engine power to the wheels in correct proportion, making it impossible to stall the tractor unless three wheels lost traction and spin. In this Rightway Drive, made by the Rightway Corporation, Builders Building, Chicago, Ill., each wheel carries its share of the weight, so that there is only half the tendency for the wheels to sink down in the soft spots as in a two-wheel drive.

The drive consists of a divided jackshaft with a standard differential mounted between its two elements. In the same housing and to the rear of the jackshaft is a solid axle carrying the auxiliary traction wheels, driven by a single chain from a sprocket mounted upon the cage of the jackshaft differential. Although two or more wheels may be mounted on this solid axle, the drive is really a three-point drive. The unit is pivotally attached to the tractor and is driven by chains from sprockets on the inner side of the tractor wheels to sprockets on the jackshaft. Thus, the differential action between the ends of the main tractor axle and the jackshaft is complete, but the action in the auxiliary differential is accomplished in a reverse manner. In other words, while the power is transmitted to the ends of the tractor axle through a differential in the conventional way, the power to the solid axle is transmitted from the auxiliary differential cage.

Heretofore, the problem has been to balance the load on both sides of the differential to prevent slippage. The Rightway drive provides this needed balance, automatically reversing the resistance afforded by the auxiliary traction wheels from one side of the differentials to the other. If one or both of the tractor wheels lose traction, the power they are unable to utilize is all transferred to the auxiliary wheels. As long as these auxiliary wheels have adequate footing, the vehicle will move forward, and as soon as its wheels regain traction, the load is retransfered to them exactly in proportion as their traction is restored. Because of the absence of spinning, the wheels recover their traction sooner than otherwise and the wear on the tires is greatly reduced.

RIGHTWAY FOUR-WHEEL DRIVE FOR TRACTORS

AMERICA'S POLICE MOTORCYCLE

1931 MODEL

IMPROVED in performance, equipment, comfort, and in many features—here is the greatest motorcycle Harley-Davidson has ever built for police service.

It combines to a greater degree than ever the speed, dependability, and economy which have put more Harley-Davidsons into police service than all other makes of motorcycles put together.

Among the new features of the 1931 Harley-Davidson are Large Solo Headlight — Disc Horn—Chromium Plating of all bright parts—Burgess No-Back Pressure Muffler, and a number of mechanical refinements that make for better performance and economy.

For all kinds of police work the Harley-Davidson has been the preferred motorcycle for many years — and the 1931 model is our finest.

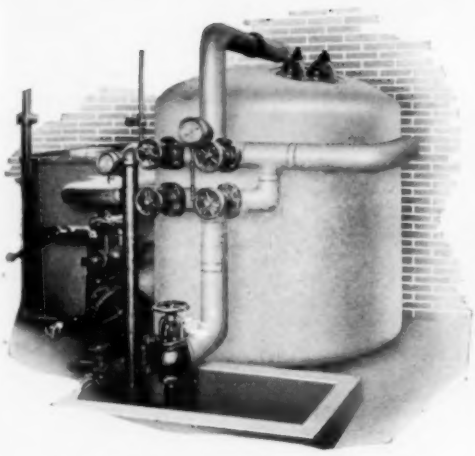
HARLEY-DAVIDSON MOTOR COMPANY
DEPARTMENT M. MILWAUKEE, WIS.

HARLEY-DAVIDSON

HARLEY-DAVIDSON POLICE MOTORCYCLES FOR 1931

WRITE FOR THIS BOOKLET

—it will give you all the facts you want about the 1931 models of America's Police Motorcycle



VERTICAL PERMUTIT CONDENSATE FILTER INSTALLATION

Removing Oil from Condensate

The use of condensed steam for boiler feed water is a natural and economical arrangement for a boiler plant, but to use it successfully the water must first be freed from oil. The problem differs from ordinary filtration in that the oil is present both in suspension and in emulsion. The former generally can be strained or filtered out by passing it through filter cloth, sand or any ordinary filter medium, but in the emulsified state, the oil particles are too finely divided to be caught by ordinary filter mediums, and special methods have to be employed.

Oil in boiler feed water will deposit on the internal surfaces of a boiler, causing burning, blistering, failure of boiler tubes, plates, etc., and priming or foaming. It offers a greater heat insulating effect than boiler scale, thus wasting fuel, and is itself a scale-forming factor, as it helps to catch and cement precipitates on the wetted surfaces of the boiler.

Permutit condensate oil-removing filters, made by The Permutit Co., 440 Fourth Avenue, New York, combine a specially designed filter with a simple chemical feed. These filters remove all the oil that is in both suspension and emulsion by coagulating the small particles into clusters which are caught and retained in the filter bed.

The apparatus consists of a steel pressure filter of either vertical or horizontal design, filled with specially selected and graded filter material. A secondary system of header and lateral piping is provided just above the strainer system for blowing air through the filter bed during cleaning. If compressed air is not available, steam jet compressors may be installed to supply the required volume of air for this agitation. An extra inlet pipe connection provides clear, cold, raw water for washing, as hot condensate should not be wasted for this purpose.

A solution tank is also connected to the filter through the wash inlet line at the base, and a steam injector is provided to force the hot cleansing solution into the filter from this tank during the scouring process.

A Signal Belt for Directing Traffic

Providing an adequate, all-purpose method of directing traffic under all conditions, the Powell traffic signal belt is made by the Powell Signal Belt Co., Inc., Washington, D. C., and is distributed by the Graybar Electric Co., with offices in all principal cities.

The belt is equipped with Eveready dry batteries and is made of the finest leather and fittings, all wiring being neatly concealed. It weighs approximately 4 pounds, including the batteries. The green and red electric light on the belt are easily visible at 700 feet.

During rush hours when congestion is heavier and when 75 per cent of all auto accidents occur and at special gatherings or on state and municipal highways, the belt finds its greatest use. It allows free movement of the arms at all times and insures the safety of the officer on night duty, preventing injury by careless drivers and eliminating the arguments that arise regarding mistaken signals.

Small communities will find it effective, as the belt will enable one or two officers to easily handle traffic, while large cities, which are already equipped with stationary lights, will find it useful at poorly lighted, congested corners.

POWELL TRAFFIC SIGNAL BELT

Paving Brick Manufacturers' Annual Meeting

The Twenty-fifth Annual Meeting of the National Paving Brick Manufacturers Association will be held at the William Penn Hotel, Pittsburgh, Pa., on February 4, 5 and 6, 1931. The sessions will be open to the general public, and anyone interested in street and highway development is invited to attend.

The program now under preparation will be presented by prominent engineers and paving authorities and will include descriptions of recently constructed brick highways and discussions of such subjects as the resurfacing of old pavements with vitrified brick, the salvaging of old brick in reconstruction projects, fillers for vitrified brick pavements, efficient management of brick paving contractors, and highway research as applied to brick pavements.

The annual banquet will be held on Thursday night, February 5, and business conferences will be held on the first day of the meeting.

George F. Schlesinger, formerly State Highway Director of Ohio, is Chief Engineer and Managing Director of the National Paving Brick Manufacturers Association.

Changes in Wallace & Tiernan Personnel

Wallace & Tiernan Products, Inc., have announced the appointment of F. G. Merckel, for the past eight years manager of the Chicago office, as sales manager at the company's head office in Belleville, N. J. C. O. Bruden, formerly assistant manager, will assume the position vacated by Mr. Merckel.

W. A. Hockett, Manager of the Indianapolis district office, has been transferred to the home office in Newark, N. J., where he will have charge of Wallace & Tiernan Company's foreign activities. E. F. Kinney has been appointed to succeed Mr. Hockett. Charles H. Eastwood, formerly in charge of foreign sales, is now in charge of advertising and publicity for Wallace & Tiernan Co. and Wallace & Tiernan Products, Inc.

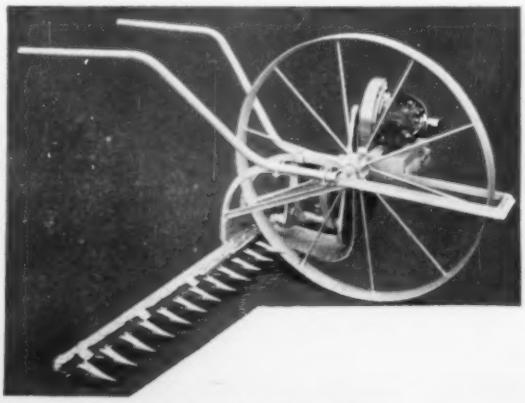
New Tulsa Office for Chicago Bridge and Iron Works

The Chicago Bridge & Iron Works, 2127 Old Colony Building, Chicago, Ill., has opened a new sales office in the Exchange Bank Building, Tulsa, Okla. The new office is in charge of D. A. Leach, who was formerly connected with the company's New York office.

A New Motor Scythe

For mowing in city parks, between sidewalks and curbs, in vacant lots, in orchards, in cemeteries, along irrigation ditches and canals, in airports, natural parks, and forest preserves, and on golf course roughs and fairways, the new Rawls motor scythe, made by the Rawls Manufacturing Co., Streator, Ill., offers an economical, low-cost method.

One man can easily do the work of 15 or 20 using hand scythes and, as the machine weighs only 114 pounds, it is handled easily anywhere. It is powered by a ½-horsepower, 2-cycle Johnson gasoline motor and has a 3-foot cutter bar. The steel frame is made in one piece without bolts or rivets, and the mower has one 32-inch ball-bearing wheel. The gasoline tank holds 3 quarts, enough for 4 hours' work.



THE RAWLS MOTOR SCYTHE

MAKING THE SLAB A SOLID UNIT

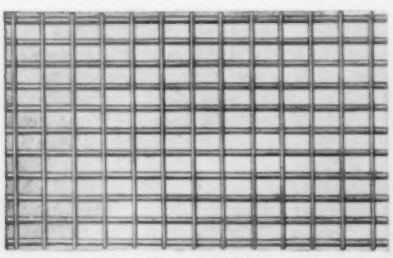
with

American Steel & Wire Company
WIRE FABRIC

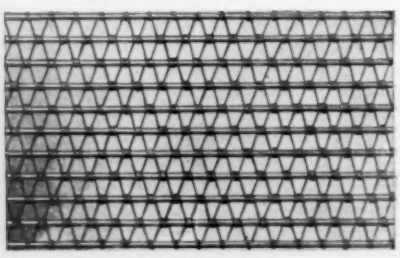
GIVE concrete paving a steel backbone of Wire Fabric and you prevent the development of cracks. The closely spaced wires distribute the reinforcement throughout every part of the slab insuring maximum binding strength.

The economy through lower maintenance costs of this permanent construction is endorsed by the Highway Research Board, National Research Council, in a special report on the subject of paving.

Wire Fabric is manufactured by the American Steel & Wire Company in sheets of definite size, which are easily handled and placed by the men on the job.



Electric Weld



Triangle Mesh

AMERICAN STEEL & WIRE COMPANY

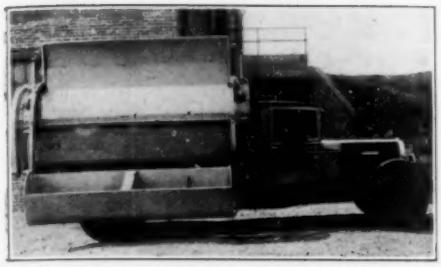
SUBSIDIARY UNITED STATES STEEL CORPORATION

208 S. La Salle Street, Chicago — 30 Church Street, New York

Other Sales Offices: Atlanta Baltimore Birmingham Boston Buffalo Cincinnati Cleveland Dallas Denver Detroit Kansas City Memphis Milwaukee Minneapolis-St. Paul Oklahoma City Philadelphia Pittsburgh Salt Lake City St. Louis Wilkes-Barre Worcester

Pacific Coast Distributors; Columbia Steel Company, San Francisco Los Angeles Portland Seattle Honolulu

Export Distributors: United States Steel Products Co., 30 Church St., New York City



SPECIAL TRUCK FOR GARBAGE COLLECTION IN HACKENSACK, N. J.

New Waste Collection Body Saves Dust and Odor

Collection of ashes, garbage and other waste with elimination of dust and undesirable odors is facilitated by the new type of truck that has just been put into service by the city of Hackensack, N. J. This collection unit consists of a Colecto body, made by B. Nicoll & Co., Inc., 294 Madison Avenue, New York, mounted on a Reo Speed Wagon chassis.

In service a bucket is lowered on each side of the body to receive the barrels and baskets of waste as the car moves from house to house. When fully loaded, the bucket is hoisted so that the load is dumped into the body proper. The bucket then returns automatically to lowered position. When the bucket returns to receiving position, a shield falls in place on the body, this preventing the dissemination of dust and odors.

Officials of the Hackensack Department of Public Works are well pleased with the new truck and say that it is much more efficient than the ordinary collection equipment.

Eliminating Sewage Odors

A cheap and effective means of chemically treating industrial waste with nitrate of soda previous to its discharge into streams, to prevent pollution, is being applied by a Boston engineering concern which specializes in sanitary work. Tests with the new American synthetic nitrate of soda, recently put on the market by the Barrett Co., 40 Rector Street, New York, are being made in various places in the United States.

The new use for nitrate of soda was discussed a short time ago at a meeting of the American Chemical Society at Columbus, Ohio, where several engineers endorsed its use in sanitary work.

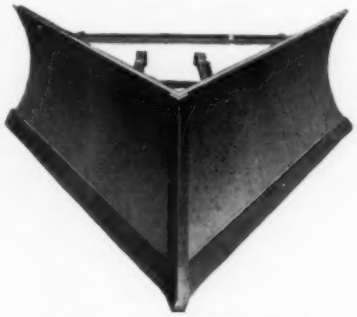
The chemical explanation of the action of nitrate of soda in treating waste is that it acts as an oxidizing agent. It furnishes active atoms of oxygen, which do the oxidizing. It then gives up the inactive atoms of oxygen that are dissolved in the waste solution, making them active. These atoms are in turn given up to do their oxidizing work, and the process continues, the amount required depending upon what sort of waste is to be treated. Generally it has been found that a pound of nitrate of soda should be used for every 1,000 gallons of waste water. The method of treatment is to allow water containing nitrate of soda to trickle into waste water just before it empties into a stream.

It is also being used to prevent putrefaction of sewage in streams near manufacturing towns and cities, to stop objectionable odors. In this kind of work the nitrate is dumped at intervals into rivers, where it goes quickly into solution. Further investigations are being made to determine the proper amounts and best methods of application in each case.

A Light Snow-Plow for Passenger Cars or Light Trucks

A light snow-plow which may be used on passenger cars or light trucks, automatically taking the direction of the car at the slightest turn of the wheel and which can be attached or detached in five minutes, is made by the Empire Plow Co., Cleveland, Ohio.

The standard model is constructed of heavy-gage steel and weighs about 300 pounds. It is specially shaped and thoroughly braced, the weight being carried upon a specially constructed self-steering runner at the front which holds the plow from 1 to 4 inches off the ground as desired. It is attached to the car by axle clamps, which may remain on the car all season, the removal of two hinge bolts disconnecting the plow.



THE MEYER AUTO SNOW-PLOW

The blades are 24 inches high and are so constructed that the plow divides and rolls the snow, making its path with little resistance. The plow clears well beyond the car wheels, being 78 inches at its widest point. It can be stored in a space approximately 5 x 2 feet and can easily be handled by one man.

This Meyer plow is the Standard Model and is for use in estates, cemeteries, townships, etc., where it is desired to clear roadways of deep snow. This is made also in a straight-blade reversible type.

A second model is the Speed Plow—light but very strong—carried on cars and trucks to enable them to travel over snow-bound tracks. This model is particularly desirable for delivery service of all kinds, to prevent loss of deliveries after severe snow-storms and to avoid repairs caused by forcing the car through deep snow and ruts.

International Filter Co. Moves

The International Filter Co. and associated companies, International Water Softener Co. and General Zeolite Co., announce that the expansion of their manufacturing facilities requires removal of their general offices and engineering departments from Plant No. 1 at 333 West 25th Place, Chicago, to larger quarters covering the 13th and part of the 14th floor of the Buckingham Building, 59 East Van Buren Street, Chicago, Ill.

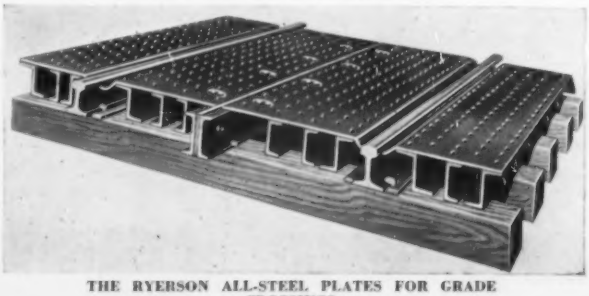
New All-Steel Grade Crossing

A highway crossing made entirely of steel, that will withstand the heaviest traffic loads, has been placed on the market by Joseph T. Ryerson & Son, Inc., 2558 West 16th Street, Chicago, Ill.

It is made of ¼-inch steel plates, firmly riveted to steel channels and zees. A feature of the crossing is the ease with which it is installed. Four men can put in an 8-foot section in less than a half-hour, as each section is ready for traffic after four simple operations. First, the outer plates are secured by placing the ends under the ball of the rail and locking them to the rail by means of rail clips and anchor rods. The center beam is spiked firmly into the ties and the two center plates are then placd in position by slipping their flangeways under the ball of the rail. The installation is completed by fastening the center plates with the patented locking device, and the crossing is thus held in place regardless of traffic strain.

Where it is necessary that two rails be electrically insulated from each other, two rolled steel channels are bolted together with a 1-inch cresoted wood strip between, the bolts being provided with fiber bushings and washers. These bolted channels are then spiked midway between the rails in place of the center I-beam. The ends of the crossing are bent down to the ground to prevent dangling chains or air hose from catching in the crossing. Ample circulation of air insures against rotting of the wooden ties.

This all-steel crossing includes several safety features. The plates have a tread which prevents skidding, and they are on an exact level with the tracks and highway, making a smooth riding surface. During the winter months, while there may be snow on the highway, the crossing will usually be clear, as the snow does not tend to cling to the cold steel and is easily blown off.



THE RYERSON ALL-STEEL PLATES FOR GRADE CROSSINGS

WILMINGTON INSTALLS 4 MORE GENERAL MOTORS TRUCKS!

. . . . records show that over a period of 7 years General Motors Trucks in the service of this Delaware city have averaged only $6 per month, per truck, for parts. Sixteen trucks of this make are now in the city's service handling many varied jobs.

THE four big, handsome Model T-60 General Motors Trucks above, equipped with special dump bodies and hoists, were recently put to work collecting garbage and ashes.

The low upkeep cost, noted above, of the General Motors Trucks which have served Wilmington, Delaware for the past seven years, was a big factor in the selection of the new equipment, according to Mr. H. Maier, city engineer.

"This ability to stay steadily on the job has been matched by most excellent performance. Every truck of this make in our service is a real worker."

3-TON RANGE

$3135

Model T-60C . . . . Straight Rating 18,500 lbs., total gross weight including load . . . . 4 chassis and 18 types . . . . price, chassis only, f.o.b., Pontiac, Mich.

The great General Motors Truck line offers 420 choices in standard chassis and tire combinations. It covers every capacity range from the ¾-ton range to the 15-ton tractor range, without a gap in the line.

For *any* municipal, county, or state haulage job there's a modern, rugged, 6-cylinder General Motors Truck that is exactly *right* for the job. It will handle the work with "made-to-order" efficiency and economy.

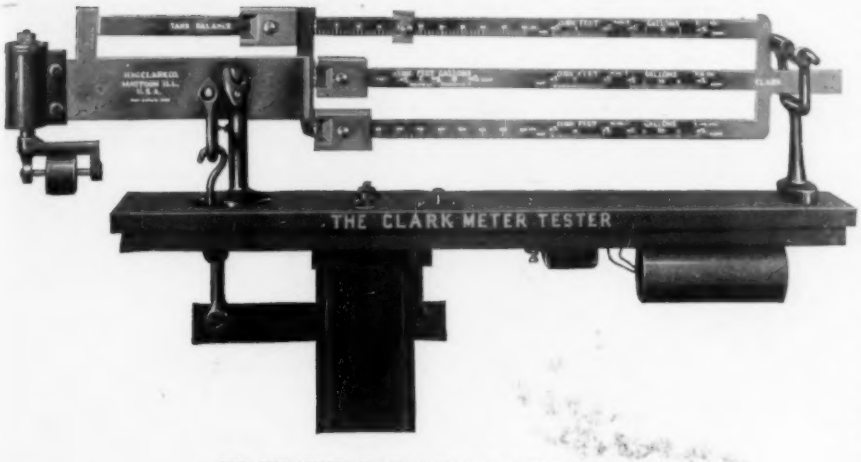
Investigate this great line—today.

GENERAL MOTORS TRUCKS

TIME PAYMENTS, on any General Motors Truck, are financed at lowest rates available anywhere, through our own Yellow Manufacturing Acceptance Corp. GENERAL MOTORS TRUCK CO., Pontiac, Michigan (*Subsidiary of* Yellow Truck & Coach Mfg. Company) GENERAL MOTORS TRUCKS . . . YELLOW CABS . . . COACHES. *Factory Branches, Distributors, Dealers—in 1500 principal cities and towns.*

PRODUCT OF GENERAL MOTORS

When you write for that catalog, kindly mention THE AMERICAN CITY.



THE IMPROVED CLARK METER TESTER SCALE BEAM

Water-Meter Tester Scale Beam

Most water plants test their meters on meter-testing machines of the weighing type. One or more meters are placed on a test bench and clamped in place. The water is passed through them by suitable fractional flow valves or sensibility test cocks, and gages show the pressure drop, from which loss in head and friction may be calculated. These scales have generally been equipped with special percentage beams which dispense with the calculation of percentage. Various weights were devised to hang on the end of the beam so that the percentages could be read on weights of from 1 to 10 cubic feet and 10 to 100 gallons. The graduations on the percentage beam were spaced equidistant so that the percentage of inaccuracy was based on the amount of water registered by the meter.

However, the Standard Specifications for Cold Water Meters adopted by the American and New England Water Works Associations, read: "The registration on the meter dial shall indicate the quantity recorded to be not less than 98 per cent nor more than 102 per cent of the water actually passed through the meter while it is being tested at rates of flow within the limit specified herein under normal test flow limits."

Conforming to these specifications, the new Clark meter tester scale beam was designed by the H. W. Clark Co., Mattoon, Ill. To base the percentage of inaccuracy on the amount of water passed through the meter instead of on the registration, the graduations are not spaced equidistant, but increase accordingly. Thus, a meter registering 10 per cent slow on the basis of water actually passed is registering 91.1 per cent slow on the basis of meter registration. This scale beam also eliminates all loose weights which were formerly hung on the end of the scale beam. It is equipped with an electric alarm buzzer which signifies the closing of the test. The sensitivity of the scale has been increased considerably. When the scale is balanced with 100 gallons of water in the tank resting on the scale platform, the addition of ⅛-pint of water to the tank is sufficient to throw the scale beam out of balance.

Hydraulic Snow-Plows Clear Closed Roads

In looking for a suitable place to conduct a severe test of the Wertley snow-plow, powered with a Cletrac 40 tractor, made by the Cleveland Tractor Co., Cleveland, Ohio, John H. Wertley, Hamburg, Pa., inventor and designer of the plow, located a dirt road in Windsor Township, Pa., closed through the winter and filled with over 4 feet of packed and frozen snow and snowcrust ice, so solid that the entire unit, weighing over 9 tons, was driven across the top.

A mild day was awaited, anticipating a thaw to enable the plow to get beneath the frozen drifts. A few drifts of the tons of snow and ice revealed a small creek beneath it which softened the dirt road to a depth of 12 inches. This road is located in a 4-foot cut, and the snow and ice were piled to the height of the fence located on the road banks 8 feet above the roadbed. The road was cleared and the work highly praised by the township and state highway officials witnessing the test.

This plow is of the semi-arrow type, eliminating resistance to a high degree and cutting a straight path, the weight being distributed between the front shoes and the tractor. This prevents the plow from riding over frozen drifts. The tractor saddle allows the tractor to function freely and prevents undue strain on the tractor and the engine. The hitch allows the plow to slide up and down with the inequalities of the roadbed, preventing strain on the plow and tractor. The plow is quickly attached or detached, leaving the tractor available for other purposes.

The Wertley plow has a width of 6 feet 7 inches at the bottom and 8 feet at the top, and a height of 5 feet 2 inches with a deflector blade 2 feet high and wings 3 feet wide. The cutting blades are made of plow steel, while the plow and wing shoes are made of manganese steel and the main castings of electric alloy steel. It is equipped with a Wood hydraulic hoist and pump, cut steel pulleys and gears, and Alemite lubrication.

Paradon Appointments

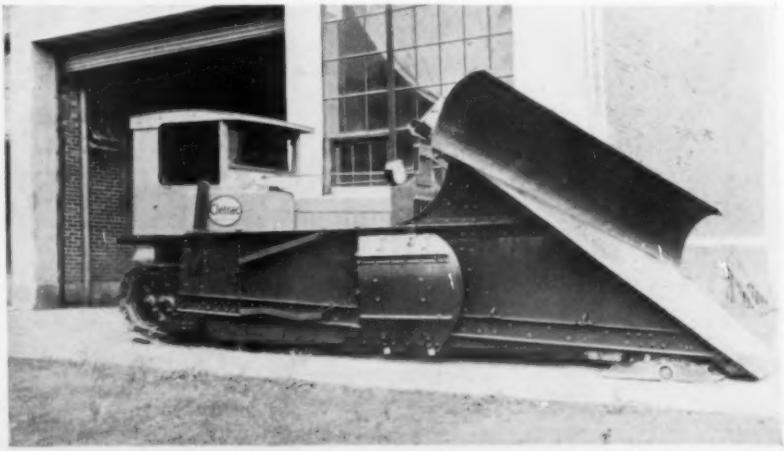
The Paradon Manufacturing Co., Arlington, N. J., has announced that M. B. Urquhart, 509 17th Street, Denver, Colo., has had his territory for the sales and service of Paradon chlorinators expanded to include the states of Utah, Wyoming and New Mexico, in addition to Colorado.

Francis D. West, who for the past ten years has been Manager of Sales for the Permutit Co., in northern and western New York State, has been appointed Manager of Sales for Paradon chlorinators, with headquarters at Arlington. George Bird, who was formerly engaged in field sales and service work, is now Assistant Manager of Sales, at Arlington.

Wilmer C. Hanson, has been appointed export manager for this company with headquarters at 30 Church Street, New York. Mr. Hanson was formerly connected with George Nolan & Co., exporters of engineering equipment to South American countries.

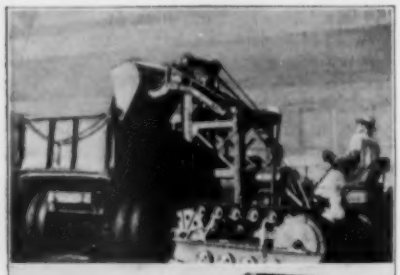
Nebraska Representative for Chicago Pump Co.

The Chicago Pump Co., Chicago, Ill., has announced the appointment of H. G. Ragan, Brandeis Theater Building, Omaha, Nebr., as its representative to handle all pump business in that territory.



A WERTLEY HYDRAULIC SNOW-PLOW ON A CLEVELAND TRACTOR

TRACKSON
TRACTOR EQUIPMENT



MANY ROAD BUILDERS and contractors select Model DH Trackson McCormick-Deering because they find that this crawler-tractor has certain features of design and operation which make it better suited to their exact needs. Other machines satisfy them quite as well in power, durability and economy. But only in Model DH do they find combined all the other features they demand: greater tractive surface, fewer parts, simpler adjustments, and wider clearances for the easy attachment of equipment.

TRACKSON LOADER with its 7-foot dumping clearance will load a large truck in a few minutes. Only a big shovel can equal its dirt-moving ability. Nothing equals its mobility, speed and economy on the average job. It works in any soil without getting stuck and it gets to any job quickly without ruining the pavement or breaking down the bridges.

TRACKSON HOIST is built strong and easy running to insure long life and maximum hoisting profits. It is made in both the portable and stationary models and furnished either as a single or double drum unit. The top drum can be installed any time the user needs it without alteration to the main drum. A special level-winding device is optional as extra equipment for both drums and adds greatly to the life of the cable.

TRACKSON TRENCH ROLLER saves the cost of hand tamping and gravel refills by packing the dirt back into the trench as solidly as it was before the trench was dug. In operation its wide-spaced, light-footed crawlers straddle the trench and roll the 3500 lb. roller back and forth as the dirt is shoveled in. Where conduit, cable or small pipe is laid extensively, Trackson Trench Roller brings unusual economies. Write for details.

Trackson Company
CRAWLERS AND TRACTOR EQUIPMENT

1322 SO. FIRST ST. MILWAUKEE, WIS.